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# Journal of Educational Research

OFFICIAL ORGAN OF THE
EDUCATIONAL RESEARCH ASSOCIATION

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VOL. VII FEBRUARY, 1923 No. 2

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JOURNAL *of* EDUCATIONAL RESEARCH

Volume VII FEBRUARY, 1923 Number 2

# THE EDUCATIONAL SIGNIFICANCE OF MENTAL TESTS

B. H. BODE
*Ohio State University*

The most striking development, within recent years, in the field of education is undoubtedly the movement known as mental tests and measurements. It had long been known that pupils differed widely in capacity. But these differences were based on impressions or haphazard evidence, not on objective and relatively simple tests. Now, however, the scientist has invaded this field and has demonstrated that, even here, the application of scientific tests is not beyond the range of possibility. Already we speak familiarly and fluently of mental age and I.Q., which are the symbols of increased refinement in judgment. That the achievements of mental testing will have an important bearing on educational practice in the future is scarcely to be doubted.

It is still too early, perhaps, to forecast accurately the significance of mental tests. But the early reports that are coming back from this new scientific firing line are startling enough to cause wonder and fear. We are told that 25 percent of the population is subnormal, that the average mentality of the nation is slightly over thirteen years, that only 15 percent are fit to go to college, and that 60 percent of the whole population is poorly adapted—or worse—for high-school work. In the face of such returns, we can no longer dismiss Carlyle offhand as a dyspeptic grouch when he says, "England has a population of twenty-six million, mostly fools." On the surface, at all events, the facts constitute a magnificent vindication of Carlyle's insight. To be sure, he did not undertake to prove that the I.Q. remains constant,

but we would probably have regarded this constancy as a self-evident fact; and, anyhow, this point has been covered by the researches of our scientists. But if we go as far as this, is not Carlyle justified in his scorn of democracy and the popular ballot, on the ground that the multiplication of ignorance and foolishness cannot produce wisdom?

To some observers it seems abundantly clear that a revision of our conceptions of democracy and of education is logically inevitable. It is predicted that the mental tests will eventually be used to select certain people as members of an intellectual aristocracy, in order that they may be trained for positions of benevolent autocracy over their less fortunate fellow-citizens. President Cutten of Colgate University, for example, presents an outline of such a scheme, which he calls "The Reconstruction of Democracy."[1] Perhaps a social reorganization of this general character will eventually result, but the zest with which these theorists engage in the work of reconstruction is hardly reassuring. It suggests considerably more fondness for reconstruction than for democracy. To see democracy thus being reconstructed becomes painfully reminiscent of the young lady who smiled as she rode on the tiger. As in the case of the young lady, democracy is finally reconstructed so extensively that its presence is no longer discernible by the naked eye.

The question, however, is not what we should like, but what the facts dictate. We of the present generation have been trained into a reverential attitude towards science. Our outlook upon the world is determined essentially by the findings of science, which we accept largely on the basis of authority. When a fact is established scientifically, our sense of intellectual and moral integrity requires us to acquiesce. But we have also learned that it is not always easy to distinguish between fact and inference. The facts may blend so intimately with assumptions, inferences, and anticipations that the innocent bystander is likely to accept the whole composite as a deliverance of science. When it was shown, for example, that all our conscious experiences are

[1] Cutten, George B. "The reconstruction of democracy," *School and Society*, 16:477-489, October 28, 1922.

cerebrally conditioned, it was regarded by some as proved that "the brain secretes thoughts as the liver secretes bile," or even that mind is nothing but a physical process going on in the brain. When new discoveries are made, it may be exceedingly difficult to determine just what it is that has been proved.

Let me try to be more specific. Perhaps the evidence is sufficient to prove that the I.Q. tends to remain constant. Perhaps it is possible to predict with reasonable accuracy how well a pupil can do the work in the various grades, and which point, approximately, will represent his educational "farthest North." These are matters concerning which I do not pretend to have expert knowledge and which I do not desire to call into question. But the significance of this limitation is a different matter. The proof of such limitation does not necessarily warrant the inference that certain pupils should be assigned to vocational training, and that certain others should be especially trained for leadership. The only conclusion that is warranted is that some pupils are not capable of profiting beyond a certain point by our present curricula and our present methods of teaching. Apparently we have gone on the assumption that our present curricula and teaching methods represent, not merely the chief, but essentially the only road to the ideal of a liberal education. If this assumption should prove to be questionable, then, in the language of the race-track, "all bets are off," and it becomes necessary to take another survey of the facts before we make a move.

What is the primary purpose of public education in a democracy? We have told ourselves, in season and out of season, that the cultivation of common traditions and aspirations is indispensable, if our democracy is to endure. There must be understanding, and the sympathy and cooperation that spring from understanding, or there can be no safety in the future. Our first obligation is to learn how to live together. This, I take it, is the democratic conception of a liberal education. It subordinates utilitarian interests to the great aim of making men human through the cultivation of a common life. This aim we are now called upon to reject, because the mental tests indicate that the

majority of the population are not well adapted for secondary and college education. Before we allow ourselves to be stampeded by alarmist utterances, it would be worth while to inquire whether our secondary schools and colleges, as now constituted, are indispensable means for this end. We might inquire, further, whether, as a matter of fact, these educational agencies were created and organized with primary reference to the democratic ideal of education.

If we approach the matter historically, we need not go far to discover that the college, at all events, was not conceived in the spirit of democracy. The same may be said of the secondary schools, in so far as these were subject to the dictation of the college. As Dorothy Canfield remarks in her recent novel, "Rough Hewn," the preparatory school "realized the ideal of the eighteenth century educator who felt that the only safe upbringing for boys would be to shut them up in a barrel, between the ages of twelve and eighteen, and feed them through the bunghole." People who argue that we must begin to conduct our educational activities on the basis of an aristocratic ideal do not seem to realize that this is what we have been doing all the time. At the upper end of the educational scale, certainly, the general trend, in so far as it was directed by a conscious ideal, has not been towards the cultivation of wider comprehension and wider sympathies, as regards the concrete, practical affairs of life, but away from them.

Fortunately, the public high schools did not submit to the jurisdiction of the college with complete docility. It was felt all along that there was an important difference between preparation for life and preparation for college. The revolt, however, has brought other evils and other dangers. The present-day movement in the direction of vocational education springs largely from the mistaken notion that preparation for life is identical with preparation for a vocation. Unless we bear constantly in mind that public education has no proper concern with vocation at all, except in so far as training in vocation may serve to promote the ends of democracy, this whole vocational movement will play directly into the hands of the enemy. It will mean a

practical acceptance of the view that advanced education should be limited to the chosen few, and that the rank and file are to be predestined by their training to become uncomplaining hewers of wood and drawers of water.

We have heard much of late years about individual differences. The recognition of these differences is, without doubt, of tremendous educational significance. But what, precisely, is their significance? We are disposed to assume that, if a boy has marked mechanical ability and does not care much for books, he should be set apart for a vocational education. But what is to prevent us from training this ability so that it will become a basis for the development of shared interests and shared aims, in accordance with the ideal of democracy? Agriculture and home economics, for example, may both be used to give insight into the human significance, not only of these subjects, but of chemistry and geography; mechanical construction and commercial relations may both serve as a gateway to a wider appreciation of human relations as involved in numbers and in the origin and quality of materials. Pupils who have neither taste nor aptitude for the expertness of the academic specialist may make real progress along such lines. The real teacher, like the real missionary, is all things to all men, in order that all may be brought into the educational Kingdom of Heaven. The recognition of individual differences should mean simply that the means must be various, although the end is one. But, as a matter of fact, the recognition of individual differences has led to the inference that the end was all a mistake and that it is the duty of the educator to accept as a limitation what he should regard as a challenge, if not as an opportunity.

It will be said, perhaps, that all this is but an attempt to blink the fact of individual differences in intelligence. When people begin to talk about democracy they create a haze of sentimentality in which it is easy to lose sight of the disagreeable fact that the educator is as incapable as anyone else of making a silk purse out of a sow's ear. "What is preordained by the protozoa can not be changed by act of Parliament." There are levels of intelligence, certainly, of which nothing much is to be expected. I have

no desire to gloss over this fact. My concern just now is with the contention that there is a difference between saying that the bulk of the population is not well adapted for meeting the requirements of our high schools and colleges and saying that they are not to be nurtured in the mental outlook, the traditions, or ideals which constitute our common heritage. Nothing short of this is democracy. And I submit that there is nothing in the results of mental testing which shows this to be an impossibility.

It was Burke, I believe, who said at the time of the American Revolution that "you cannot indict a nation." A standard that leads to such a result has something the matter with it. At any rate, when we are told, or seem to be told, that the average man is deplorably below the average, the argument somehow fails to carry conviction. The outsider, if he is reflective, tends to become confused, and he is likely to feel thankful that the mental testers did not have an opportunity to search him personally for this thing called intelligence. Perhaps it is true that, judged by the mental tests, this is a nation of thirteen-year-olds. Perhaps something similar would be found true if the population were to be judged by college standards. But when such results appear, it does not follow that the time has come to abandon democratic ideals of education. It does not follow that the rank and file of the population must be consigned to vocationalism, on the ground that this is their only opportunity to "make the most of themselves." What we need to do is to find out more precisely what it is that is being measured.[2]

There is reason to suspect that the development of mental tests and measurements has brought with it a recrudescence of faculty psychology. Some writers, indeed, openly claim that intelligence is a single thing. The majority, as far as I can make out, refuses to commit itself on this point, and tries to "play it safe" by using such phraseology as the "capacity to handle abstractions" or "the ability to learn." But the evil delusion may conceal itself behind the verbiage, and it may be much strengthened by the evidence which points to a tendency of the I.Q. to

[2] Cf. Dr. W. C. Bagley's brilliant article, "Educational determinism" in *School and Society*, 15:373-84, April 8, 1922.

remain constant. The pessimism that has been generated by the results of mental testing is probably due primarily to the assumption that intelligence is a fixed and changeless thing. We can gauge the approximate amount of intelligence as we can record the position of the fixed stars, but there is nothing that we can do about it. As Thorndike says, however, "It is probably unwise to spend much time in attempts to separate off sharply certain qualities of man, as his intelligence, from such emotional and vocational qualities as his interest in mental activity, carefulness, determination to respond effectively, persistence in his efforts to do so; or from his amount of knowledge; or from his moral or esthetic tastes. Even so apparently remote a trait as muscular strength may in some cases cooperate almost indistinguishably in the production of what we would all call intellectual products. Thus a great scholar's achievement may be in part due to eye muscles which help making reading a pastime."[3]

Taken superficially the facts involved in mental testing may be explained either in terms of a single intelligence or from the standpoint that intelligence is a composite affair. Terman, for example, tells us that "Some children with I. Q. as high as 75 or even 80 will have to be classified as feeble-minded; some as low as 70 I.Q. may be so well endowed in other mental traits that they may manage as adults to get along fairly well in a simple environment."[4] Here the suggestion is conveyed that intelligence is a single thing, and that the shortcomings of intelligence may be compensated for by the operation of "other mental traits." Conversely these other traits may interfere with the processes of intelligence, as in the case of the ten-year-old boy with an I.Q. of about 125 who "was once diagnosed by a physician as feeble-minded. His behavior among other persons than his familiar associates is such as to give this impression."[5]

This interpretation is natural and obvious. But it does not preclude the view that these "other mental traits," such as moral

[3] Thorndike, E. L. "Intelligence and its measurement: a symposium," *Journal of Educational Research*, 12: 124, March, 1921.

[4] Terman, L. M. *The measurement of intelligence*. New York: Houghton Mifflin Company. 1916. p. 87.

[5] *Ibid*, p. 103.

traits, industry, emotional qualities, and the like, are component elements in a total behavior which in its totality is called intelligence. This use of the word intelligence is justified, if by intelligence we mean the ability to exercise foresight and to use the things in our environment as means to ends; or if by intelligence we mean the ability to learn the meanings of things in terms of what can be done with them. But if we take intelligence in this sense, the I.Q. with which the mental testers deal does not measure *general* intelligence. It measures a more specialized ability or set of abilities, such as the ability to deal appropriately with the characteristic objects of a school environment.

As between these two views it ought not be difficult to choose. The "pure reason" of philosophers and the "faculties" of traditional psychology carry too heavy a load of odium to make the conception of "general intelligence" attractive or plausible. To assume that when we have ascertained a person's I.Q. on the basis of a standard test we "have measured some general power which resides in him and determines his ability in every variety of intellectual task in its entirety is to fly directly in the face of all that is known about the organization of intellect."[6] The assumption that we are dealing with a single thing and an unchangeable thing will hardly bear critical examination. The improvement of any one of the numerous factors which may enter into intelligent behavior is, so far forth, an improvement of intelligence. The evidence that the I.Q. remains constant is inconclusive on this point. It simply shows that intelligence does not change appreciably in certain simple types of situations from which the operation of factors that would be likely to make a difference have been excluded.

Let me now try to relate this general conclusion to our previous discussion. If intelligence is not a single thing, we seem to gain a new perspective on the educational significance of "mental age" and of the I.Q. These concepts, as developed in present-day tests, do not stand for hard and fast measurements of educability; and in particular they do not warrant the infer-

[6] Thorndike, *op. cit.* p. 126.

ence that the democratic ideal of education must be abandoned for any considerable portion of the population. The significance of these tests is rather that there are various kinds of grist for the educational mill. To quote again from Thorndike: "Consider a score attained by a 12-year-old boy in say a combination of Stanford-Binet, National A and B and Haggerty Delta 2 (two trials of each). If the boy has had ordinary American opportunities, this score will prophesy rather accurately how well he will respond to intellectual demands in the case of 'book-learning' at the time and for some years thereafter, and very possibly for all his life. It will prophesy less accurately how well he will respond in thinking about a machine that he tends, crops that he grows, merchandise that he buys and sells and other concrete realities that he encounters in the laboratory, field, shop, and office. It may prophesy still less accurately how well he will succeed in thinking about people and their passions and in responding to these. We know that, taking people as we find them, the ability measured by verbal tests is not the same as the ability measured by non-verbal tests, and there is reason to expect other similar specializations."[7]

The mental tests are unquestionably valuable for certain kinds of classifications and predictions. Their use, however, should not blind us to the fact that life is a garment of many hues. Thinking may occupy itself with many varieties of facts and relations, and it may occupy itself with these in various ways and with varying degrees of skill. The results of the mental tests have given new evidence for the view that education must take account of a much greater range of interests and abilities than it has done in the past. But these results have contributed nothing to shake the conviction that education in a democracy is under obligation to build upon these various interests and abilities a superstructure of common faith and common knowledge. The fulfillment of this obligation means the realization of the democratic ideal of liberal education, the ideal to which our national history has irrevocably committed us and which embodies our most cherished conceptions of organized social living.

[7] *Ibid.* pp. 125-126.

# TRAINING TEACHERS FOR MENTAL TESTING IN OAKLAND, CALIFORNIA

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## REASONS FOR TRAINING

In the extensive program of mental testing and school classification which has been operative in Oakland (California) during the past few years, it has become utterly impossible for the central agency, limited in the number of its force, to accomplish all, or even an appreciable part, of the whole program of mental testing for the fifty schools scattered throughout the city. On the other hand, if the mental test is to function properly in the placement of children, its accuracy must be unquestioned; the possibility of doing the pupil an injustice by ranking him either too high or too low in intelligence must be reduced to a minimum. Moreover, every teacher who is trained in the principles and practice of mental testing finds it an invaluable aid in her classroom teaching. These are some of the considerations which point to the importance of teacher-training for mental testing. They may be restated as follows: (1) the need of having teachers in the field to assist in the work of mental testing; (2) the necessity of securing accurate and standardized results in the test; and (3) the practical help that comes to the teacher from a knowledge of mental-testing principles.

Any one who has had ever so slight an experience with the administration of the Binet individual test in any one of its revisions realizes what innumerable possibilities exist for differences in scoring among individual examiners who have not been thoroughly trained. In a system as large as that of the Oakland schools, where the number of mental examiners is increasing from week to week, there is absolute necessity for a highly-developed standardization and a rigid adherence thereto. Consequently, for the mere purpose of giving the test, careful preliminary training and observation are essential.

There is also a second feature of the work about which the efficient mental examiner should have definite knowledge. The content of the test and its use in school classification must be familiar to all who are called upon to give advice regarding the school work of children. Such information can be gained only through careful reading and self-education or, better still, through a course of training which gives the opportunity for lecture work and class discussion.

## Method of Training

Such training has been provided in Oakland for those teachers who have been interested to take up the work. A beginning was made four years ago when a group of first-grade and kindergarten teachers took up the study of mental testing under the Director of the Bureau of Research and Guidance. Since that time the course has been offered each term, covering fifteen weekly lecture and discussion periods on the principles of mental testing. From 40 to 50 teachers have been enrolled in each series.

In addition to the instruction received through class meetings, each teacher who is interested to go further in the work is asked to submit for correction a number of preliminary tests which she has given. Through a personal conference with a representative of the Bureau of Research concerning each of these tests, the attempt is made to develop an adherence to the standard in giving, an accuracy in the mechanics of scoring, and a growth of judgment that will be of greatest possible value in the general work of child placement. After a sufficient number of tests, usually from 16 to 20, have been administered and corrected to warrant a reasonable familiarity with the technique and general method of giving and scoring, a final test is given by the teacher before a member of the Bureau of Research and Guidance; upon its satisfactory completion a certificate for individual mental testing is issued, and the teacher is henceforth known as a "certificated mental examiner."

Even at this point, however, the training in the work of individual mental testing is not complete. Tests submitted by a

certificated examiner are still checked from time to time and errors are called to the attention of the teacher concerned. It is at this time, after certification has been granted, that the real value of the teacher-training work is on trial. If it is worthy of the time and money spent upon it, those in authority must be able to place a reasonable amount of reliability upon the results of tests made after certification. That such time and expense have been amply justified in Oakland has been proved by a study of the results accruing from our method of training.

Certification for giving group mental tests is a similar process, involving (1) the preliminary course in the principles of mental testing; (2) some practice in the scoring of group test booklets; (3) observation of a group test given by an experienced examiner; (4) satisfactory giving of a group test before a representative of the Bureau.

## Results of Training

*Number of examiners.*—At present the number of certificated mental examiners is as follows: for group testing, 40; for individual testing, 60. Thirty-five additional teachers are submitting individual tests for correction, looking forward to certification in the near future. The fact that we have so large a number of examiners in the field demands the most careful checking of results; thus only can adherence to standard procedure be assured and confidence in the reliability of results be maintained.

*Accuracy before and after certification.*—The word accuracy is here to be interpreted as the absolute accuracy of the test result, as determined by the scoring and the mechanical process of computing the intelligence quotient. It does not always imply a complete correctness in scoring each section of a given test, since one or two errors may be made in a test involving several parts without affecting the final result; likewise it is frequently true that two errors in scoring cancel each other in the computation of the mental age. Hence the tables which follow are concerned wholly with test *results* as finally expressed by the Mental Age and Intelligence Quotient (I.Q.). The slightest change made necessary

in the result, as found by the examiner, even though it consists of only one point in the I.Q., for the purposes of this study marks the test as incorrect.

Table I gives the comparison of the accuracy of test results before and after certification of the 23 examiners who were certificated during the school year 1920-21. The number of tests given *preliminary to* certification is noted, with the number of these which were correct, and the resulting percent of accuracy.[1] Like data are given for tests made by these examiners, checked during the same year *after* certification had been granted. The improvement in all but three cases is apparent from the table; these three examiners who showed no growth (see No. 9) or even retrogression (see Nos. 2 and 7) have been watched carefully for further development, and all have shown improvement in the work. As indicated by the table, the median percent of accuracy in test results grew from 53.8 percent before certification to 81.2 percent within six months after the certificate had been granted; in other words 81.2 percent of all tests submitted by these examiners in the first six months after certification needed not even the slightest change to be made in the result. Clearly, from this standpoint alone, the careful instruction and conference work given appear to have been worth while.

*First ten tests vs. second ten tests made after certification.*—During the same school year 12 of the 23 examiners under consideration had time to submit at least ten tests after certification and before the end of the term. These 12 form the basis of the data given in Table II, where the percent of accuracy of test results in the first ten tests is compared with that of the second ten. Here the median percent of accuracy has increased from 75 percent to 90 percent; i. e. nine out of ten tests made by these teachers were totally without error in the results obtained.

*Extent of error in test results.*—Now arises the question, in those tests in which the result needed to be changed, due to the error of the examiner, what was the extent of the change necessary? Five points have been conceded as a reasonable probability

[1] The percent of accuracy for each examiner is the ratio of the number of correct tests submitted to the total number of tests given.

TABLE I. PERCENT OF ABSOLUTE ACCURACY OF TEST RESULTS BEFORE AND AFTER CERTIFICATION

| Teacher's Number | Before Certification | | | After Certification | | |
|---|---|---|---|---|---|---|
| | Number of tests checked | Number of tests correct | Percent of accuracy | Number of tests checked | Number of tests correct | Percent of accuracy |
| 1 | 10 | 9 | 90.0 | 16 | 15 | 93.7 |
| 2 | 16 | 13 | 81.2 | 13 | 7 | 53.8 |
| 3 | 14 | 11 | 78.5 | 16 | 13 | 81.2 |
| 4 | 18 | 14 | 77.7 | 25 | 20 | 80.0 |
| 5 | 76 | 54 | 71.0 | 25 | 19 | 76.0 |
| 6 | 10 | 7 | 70.0 | 46 | 38 | 82.6 |
| 7 | 15 | 10 | 66.6 | 20 | 11 | 55.0 |
| 8 | 8 | 5 | 62.5 | 21 | 19 | 90.4 |
| 9 | 45 | 27 | 60.0 | 20 | 12 | 60.0 |
| 10 | 23 | 13 | 56.5 | 10 | 8 | 80.0 |
| 11 | 16 | 9 | 56.2 | 10 | 9 | 90.0 |
| 12 | 13 | 7 | 53.8 | 20 | 17 | 85.0 |
| 13 | 15 | 8 | 53.3 | 10 | 9 | 90.0 |
| 14 | 10 | 5 | 50.0 | 10 | 9 | 90.0 |
| 15 | 32 | 16 | 50.0 | 10 | 10 | 100.0 |
| 16 | 10 | 5 | 50.0 | 10 | 10 | 100.0 |
| 17 | 8 | 4 | 50.0 | 28 | 20 | 71.5 |
| 18 | 35 | 16 | 45.7 | 15 | 12 | 80.0 |
| 19 | 13 | 5 | 38.4 | 25 | 17 | 68.0 |
| 20 | 27 | 10 | 37.0 | 84 | 60 | 71.4 |
| 21 | 14 | 5 | 35.7 | 20 | 17 | 85.0 |
| 22 | 14 | 5 | 35.7 | 13 | 11 | 84.0 |
| 23 | 20 | 5 | 25.0 | 23 | 18 | 78.2 |
| Median percent of accuracy.. | | | 53.8 | | | 81.2 |

TABLE II. FIRST 10 TESTS VERSUS SECOND 10 TESTS MADE AFTER CERTIFICATION

| Teacher's Number[a] | Percent of Accuracy | |
|---|---|---|
| | 1st 10 Tests | 2nd 10 Tests |
| 4 | 70.0 | 90.0 |
| 5 | 70.0 | 80.0 |
| 6 | 90.0 | 90.0 |
| 7 | 50.0 | 60.0 |
| 8 | 100.0 | 80.0 |
| 9 | 60.0 | 60.0 |
| 12 | 70.0 | 100.0 |
| 17 | 60.0 | 90.0 |
| 19 | 90.0 | 70.0 |
| 20 | 90.0 | 100.0 |
| 21 | 80.0 | 90.0 |
| 23 | 90.0 | 90.0 |
| Median percent of accuracy..... | 75.0 | 90.0 |

[a]Numbers are given to correspond with individual teacher's numbers in Table I.

TABLE III. EXTENT OF ERROR IN TEST RESULTS

| Error in the I. Q. | Before Certification | | After Certification | |
|---|---|---|---|---|
| | Number of tests | Percent of tests | Number of tests | Percent of tests |
| 1 to 3 points..... | 92 | 80.1 | 98 | 87.6 |
| 4 to 5 points..... | 13 | 10.9 | 8 | 7.1 |
| 6 to 10 points..... | 7 | 6.3 | 5 | 4.4 |
| More than 10 points.. | 3 | 2.7 | 1 | 0.9 |
| Total..... | 115 | 100.0 | 112 | 100.0 |

TABLE IV. COMPARISON OF 42 DUPLICATE TEST RESULTS

| Difference in test results (Points) | Number of duplicate tests | |
|---|---|---|
| 0 | 1 | |
| 1 | 5 | |
| 2 | 6 | |
| 3 | 4 | |
| 4 | 3 | |
| 5 | 3 | |
| 6 | 1 | |
| 7 | 5 | |
| 8 | 2 | |
| 9 | 0 | |
| 10 | 2 | In these 12 |
| 11 | 1 | cases one or both |
| 12 | 1 | of the duplicate |
| 13 | 3 | tests were made |
| 14 | 3 | before certifica- |
| 16 | 1 | tion of examiner |
| 18 | 1 | |
| Total Number Duplicate Tests.... | 42 | |

of error in determining an I.Q.; hence any discrepancy up to that extent need not cause much concern. As the error passes this point, however, it becomes increasingly serious and the examiner must be carefully checked.

To determine the degree of inaccuracy involved in the tests in which the results were incorrect, a tabulation has been made (Table III) indicating the frequency and the extent of the errors made. Here again are compared the tests as made by the 23 examiners previous to and after certification during the school year 1920-21. The figures in the table show that the median error for both groups is 2 points; but they also show that the grosser errors of 6 or more points in the I.Q. decreased by almost 50 per-

cent after certification, while those involving from 1 to 5 points form an increasingly large percent of all errors made. The utter elimination of errors involving anything approximating 10 or more points in the final I.Q. figure must be brought about if the test result is to function as it should in the problem of child placement in school work. Fortunately, since in our Oakland program the actual school accomplishment of the child is quite as important a factor in his placement as the mental test. Results detrimental to his progress are not likely to come from an imperfect test result. The closest possible correlation, however, between intelligence, as measured by the mental test, and quality of school work is one of the aims of school organization; and in the process of achieving this ideal, all possibilities of serious error in the mental test itself must be removed.

*Duplicate test results.*—Our analysis has concerned itself thus far only with the scoring of the test after it has been given. Numerous other factors are involved in the accuracy of test results, such as (1) the personality of the examiner as he administers the test; (2) the degree of *rapport* which he succeeds in establishing with the child, and the corresponding cooperation which he secures from him; (3) the degree of faithfulness with which he adheres to the standard technique of giving the test; (4) the freedom from interruption and distraction during the test. Such factors as these have been checked through observation of a test given by the examiner previous to certification, and in more than one instance, because of failure in one or another of the above points, the teacher has been required to give a second test under observation. In addition to such observation, one may compare two tests of the same child, given by two different examiners. If the results of two such tests give very nearly the same result, one may reasonably conclude that there is a high degree of accuracy in the work.

Such a method of checking has been used (to the limited extent to which it was possible) with the 23 examiners whose work is being analyzed in this study. Forty-two cases were found on record where at least one and in most cases both of the duplicate

tests of the same child had been given by one or another of these teachers, either before or after certification. A study of the agreement of the two test results furnished the data given in Table IV. Note that in 30 of the 42 duplicate test results the variation in the I.Q., as found by two different examiners, did not exceed eight points. The remaining twelve pairs varied in their discrepancy from 10 to 18 points. Further investigation, however, revealed the fact that in three of these twelve cases neither of the two examiners had yet been granted a final certificate for mental testing, and that in the remaining nine cases one of the two examiners concerned had not yet been fully certificated. In no instance where both tests were made *after* certification did the results vary by more than eight points; and in 22 of the cases under consideration (more than 50 percent of the whole number) the difference did not exceed five points.

This study of 42 cases of re-tests has been supplemented by a more recent one involving 288 cases and 84 different examiners. Some of these examiners had been certified and others had not. No distinction was made in this study between certificated and non-certificated groups, so that no complete comparison can be made. The general results, however, corroborate findings already made by other investigators with reference to the constancy of the I.Q., since the correlation found between the first and second test results was 0.90 (Pearson). In only 34 out of the 288 cases (11.8 percent) did the results differ by more than 10 points, and 26 of these can be at least partially explained on the basis of language difficulty, psycopathic conditions, or lack of a complete test. Of these 34 cases 21 involved tests of which one or both were made by examiners previous to certifications. Here again is evidence of the value of training for this work.

The results obtained through such checking processes as have been outlined above point to the material help that comes from a course of training for mental examiners leading to specific certification. Teachers who have taken the work have expressed their appreciation of the instruction received and the benefits that have accrued from it. The ideal toward which the whole work is directed is the most sympathetic and intelligent understanding

of the needs and capacities of every child in school with a view to making the best possible adjustments. Such an ideal can be attained only when those who are responsible for the analysis of needs and capacities have the proper training and adequate equipment to secure accurate results in testing and to give helpful advice for adjustment.

## Summary and Conclusions

1. Comparison of tests made by 23 examiners previous to certification and during the first six months after certification for mental testing showed a gain of 27.4 percent in the absolute accuracy of results.

2. A degree of absolute accuracy of 90 percent was reached by these 23 examiners in the second ten tests submitted after certification.

3. The extent of the error found in test results decreases after certification. Among 112 unselected tests, made by 23 examiners, 94.7 percent of all errors found in the I.Q. did not exceed five points.

4. A study of re-tests made of the same child by different examiners showed the greatest discrepancies in the case of tests of which one or both were made by examiners previous to certification. The constancy of the obtained I.Q. as determined by re-tests is, therefore, affected by lack of training and experience on the part of the examiner.

5. A preliminary course of instruction on the use of the individual mental test plus a sufficient amount of carefully supervised experience appears to be necessary for the attainment of the most satisfactory results.

6. The inauguration of an extensive program of mental testing and classification in any large school system makes indispensable the organization of an adequately trained corps of mental examiners recruited from the teachers in the field.

7. The greatest asset that can come from a program of training teachers for mental testing is a deeper understanding of the child's capacity and limitations, a more genuine sympathy with his difficulties in school work, and a keener insight into the possibilities of adjustment to meet his individual needs.

# THE PRINCIPAL'S MAIN CHANCE[1]

W. W. CHARTERS
*Director of the Research Bureau for Retail Training, Carnegie Institute of Technology*

The principal's main chance lies in training on the job.

The principal about whom I am going to speak today has a superintendent who believes that his principals should spend only one hour a day on paper work and the rest of their time on the real problems of the school. To that end he asks for as few reports as possible. Before issuing report blanks he scrutinizes them with the most stubborn care to detect all queries which are not absolutely necessary, and he rigidly follows the policy of providing enough clerical help in the offices of his principals to care for every necessary detail that a clerk can attend to.

I am about to describe the opportunities of a principal who, when relieved of office-routine-paper work, has a passion for working upon his real problems. The principal who prefers office routine to a pulsating human environment can be dragged from his office by no administrative machinery. His routine duties hold him as the magnet holds the steel. More clerks mean less leisure because he must find work for them to do. For such, fewer reports mean greater care devoted to them; his hour must be filled.

But the principal with a passion for human contacts seizes the opportunity to close his desk and meet the vital problems as they come. When he thinks of his work he does not visualize his paper work but boys and girls with childish failings and high ideals which flash and die to flash again, like the firefly's lamp in the twilight. He sees his teachers with their problems of instruction and discipline, their joyous moments of satisfactions, followed by their long periods of depressing discouragement. He sees the great city of homes from which mothers and fathers send their children to school with seriousness or indifference or flippancy. He sees the parents entering his office with timidity,

[1] Address given before the Ohio State Educational Conference, March 25, 1922.

or truculence, or kindliness, for the purpose of straightening out those childish difficulties which lie close to their hearts. Such a principal does not think of his work as the filling out of reports and the distribution of chalk and pencils. For him his vocation is the healing of human wounds, and the raising of human ideals through the most powerful of all human forces, the education of the young.

The principal has the most powerful executive position in the school system. The superintendent's position is not its equal in importance. To the superintendent belongs the duty of educating his public and obtaining the necessary financial support. To him is delegated the task of providing the buildings and equipment, the setting for the work of instruction. Upon him depends the morale of the teaching force. Of prime importance are such contributions. And it is with such an appreciation of the value of his labors, that I say that the principal has the most powerful executive position in the school system. No position is more powerful than his except that of the classroom teacher. The efficiency of class instruction is the measure of efficiency of education. For the classroom teachers all executives are hewers of wood and drawers of water. But among school executives the principal is the most important.

We give perfunctory and polite assent to this, just as the public acknowledges that the teacher and the preacher have most worthy occupations, but refuses to enter them themselves or pay the occupants commensurately with their importance. School people, similarly, acquiesce in assertions about the value of the principal, but they do not see the full significance of the position. Nor do all principals themselves comprehend the full power of their opportunities, which, if seen and grasped, would give confidence to the principal and prestige to his occupation.

Passing over the relation of the principal to the community because it has been so admirably discussed by other speakers, attention is called first to the fact that the principal is better situated than any other school officer to do training on the job. Training on the job does not mean training by lectures, by books, or by courses. Training on the job means analyzing mistakes and

correcting them. A teacher is trained on the job by a principal when the principal observes her, commends her good practices, analyzes her mistakes, and shows her how to correct them. A boy is trained on the job to follow an ideal such as courtesy when the instructor watches his actions, teaches him courteous manners, and corrects his discourtesies. Lecturing about the job is not training on the job. The instructor who trains on the job watches the performance and corrects it point by point. "Line upon line, precept upon precept, here a little, there a little."

The importance of training on the job has long been recognized. The practice school has been developed to give it. The apprentice system provides such training. The teacher in the classroom does a great deal of it whenever she allows the pupils to try and then corrects. If lectures produce 25 percent of efficiency, training on the job is the other 75 percent.

With such a definition of training on the job, it is quite clear that the principal is better situated to train his teachers than is any other executive. The supervisor who makes short contacts, on the average fifteen minutes to a teacher per month, obviously has little time to point out and correct mistakes. He is rather an inspector than a trainer. The principal, on the contrary, drops into the rooms, observes the teachers in the halls, in the office, and in conference. He gets to know the work of his teachers intimately and from his knowledge he can advise wisely and economically.

When we consider the value of such training to the new teacher we see at once that if the principal does not train her, no one can adequately do so. She is left with her own problems of instruction and of discipline. Her normal-school training goes only part of the distance to the end of her problems. She needs training on the job and when the principal is tied up with details in the office, making marks on paper, the young teacher is leaving scars on human minds, scars which, with adequate help, she would never have to leave.

The principal is remarkably well situated to make this training efficient because in his head is collected a wide variety of

methods of solving difficulties. He better than any other, can gather these methods and pool the experience of successful teachers. One teacher uses one method another teacher uses a second. No one except the principal knows these two methods for, amazingly, teachers do not talk much about their methods, usually because they do not think they are especially good. The principal in such a case becomes the repository for all varieties of methods used by all kinds of teachers. Teachers come and go and leave behind them no constructive contributions to method except as the principal collects them. With this wealth of experience he can give counsel and advice as no other person can. Through him the entire teaching corps shares in the best of each teacher.

The principal is the centre for the development of morale in the faculty and the student body. His larger vision and riper experience which cause him to distinguish between petty details and mighty principles, help him to guide his people to significant objectives. His is the fine enthusiasm and the patient contemplation of difficulties which encourage the down-hearted and cheer the optimistic. He is the lubricant of the school family. He settles difficulties, smoothes out rough contacts, and soothes jarred relations. His also is the driving force which demands firmness in the weak and conscientiousness in the careless.

The morale of a school family cannot be developed by the superintendent or his assistants. No executive can do it except the principal. The reason is clear. Morale can be developed only on the job. Lectures and inspirational addresses have a place; but in the last analysis a discouraged teacher has to be made optimistic by the removal of her individual difficulties, one by one. Friction can be alleviated only by attention to specific situations. Good will can be attained in the faculty only by the performance of specific, continuous, and frequent acts of good will. Morale is not a wholesale, machine-made product. It is hand-made, and developed point by point. This the principal can do as can no one else, because he alone of all the executives is close to his school family all the time.

If we consider the more intangible but most valuable field of ideals and social relations which are the context rather than the content of courses of study, we find again that the principal is the keystone of the arch. We all acquiesce in the belief that the ideals taught in the school are of more value than the information. As between honesty without arithmetic and arithmetic without honesty there is no choice. In comparison with kindness, history is trivial. Fortunately, it is not necessary to make a choice between honesty and arithmetic or kindness and history. Both members of the pairs can be taught. Ideals and information can both be developed. But according to our scheme of education, the core of the instruction is information and the margin is ideals. Ideals are taught incidentally, informally, and spasmodically, by example, by affirmation, and by discussion, through literature, through games, and in daily living in the school. But they are relegated to a secondary place. They are not prominently mentioned in the course of study.

There should be two foci to the instructional orbit. One of these is information, the other is ideals. To the development of ideals should be given the same attention as is given to information. For ideals there should be a course of study, as definite as for information. It should be as necessary for the first grade to accomplish the teaching of certain portions of courteous conduct as it is for it to develop certain skill in reading. These should be down in black and white in the course of study, alongside of the informational content which we now find in all printed statements for the guidance of the teacher.

That ideals should be taught as a separate course is not necessary. Ideals are usually best taught, though by no means are they always best taught, in connection with other subjects and activities. There is sometimes a place for the direct and systematic study of how to be courteous, kind, or honest. Courtesy games, lessons on kindness, stories studied for the sake of the ideal, are entirely justifiable. But to make the curriculum bi-focal does not mean that ideals must be taught as a separate subject. It means that in the course of study as well as in the

teacher's mind, ideals and information hold equal place and that each may be taught by the methods which are best suited to its development.

Since the teaching of ideals can be so easily overlooked, the principal is again the key-man of the executive force. For ideals can be taught adequately only on the job. When the teacher is overwhelmed by her tasks of teaching tangible information laid out in pages and exercises, she fails to catch all the opportunities for teaching ideals. The principal with wide experience and a truer perspective can then reinforce the still small voice of the ideal and help the teacher to increase her sensitivities to opportunities. He can point out excellent but unnoticed opportunities in the classroom. He can, indeed, develop a keener appreciation of ideals, themselves, in the young and thoughtless teacher.

Particularly he can so direct the extra-curricular life of the school in such a way as to make it contribute to the development of ideals. Conduct in the halls, in the playrooms, in the yard, or in the office, plays, games, and athletics are all parts of the extra-curricular life which he can bend to his enterprise. The teacher feels that her jurisdiction ends with the schoolroom or that outside of it there is divided responsibility and therefore little responsibility. This domain is the peculiar property of the principal. Not that he has direct control, but, like a general, he organizes his forces and details to the teachers and to the pupils their duties in connection with this most powerful portion of school life. Once the detail has been given to the teacher, she accepts the assignment; in its absence she hesitates to assume control. Once the children have been given a responsibility, they accept it and try to carry on. But the principal is the only one to take command and utilize the full resources of the extra-curricular life of the school.

Such is my idea of the importance of the principal. He alone among the executives can adequately give training on the job. He lives in his school family. He gathers a rich variety of methods from the classrooms and distributes them where they will be useful. He alone can develop morale in his teaching corps

and the student body. To him alone is given the opportunity to use to its full capacity the extra-curricular life on the school for the development of high ideals.

To do so, he must have a passion for human development. An office principal who loves the office cannot do the job. But an office principal has no business to be a principal. He is too small to handle the task of educating the young. He should be a bookkeeper or a filing clerk in a commercial office. What is needed for this task is a leader who marshals spiritual forces not columns of figures. Less than this is too little.

If the principal is the keystone of the supervisory arch, the relation of the superintendent to the principal is clear. If we place on the shoulders of the principal the duties of supervision of his school, the superintendent's task is twofold, half negative and half positive. Negatively, he will relieve the principal of all clerical work except that to which it is absolutely necessary for him to give his personal attention. Positively, he will train his principals in the art of supervision. Since teaching is the chief objective of the schools and supervision of teaching can best be given on the job by the principals, they therefore constitute the chief supervisory corps and become the superintendent's immediate family. He trains them in the art of supervision as they train their school family in the arts of teaching and of living. What they do for their teachers he does for them. His assistant superintendents in charge of instruction take on special parts of his duties and stand in his place as his representatives who carry on the same sort of training. When assistants flit in and out of rooms, their presence is of little real use except for purposes of inspection. When, however, they spend the time allotted to the school in the principal's presence, discuss his problems and instruct him in the art of proper supervision, they will have time more nearly adequate for training on the job. Just as principals should spend one hour on paper work and the remainder of the day in the school, so the assistant superintendents in charge of instruction should spend one hour on paper work and the remainder of the day with their principals.

To carry out this plan of organization of supervision adequately, teachers' colleges and normal schools have a distinct place and responsibility. They pay major attention to the training of principals in supervision and administration. They make job analyses of the principal's position, collect methods of performance, and organize them into powerful and vital courses of instruction. The courses in supervision receive all the emphasis their importance deserves. They are placed among the most important of the major courses and not in the addenda to be taught occasionally if nothing prevents.

When we recognize that the chief function of supervision is to improve children, we get a distaste for office-routine duties. When we recognize that supervision of all sorts has to be done on the job, the supervising principal and assistant superintendent cease to take a telescopic view of education and seek for direct personal contacts. Supervision is measured by its effect upon children, and the principal who has a passion for improving instruction has the greatest executive job on earth.

# THE PROGRESS OF KINDERGARTEN PUPILS IN THE ELEMENTARY GRADES

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This paper[1] reports the results of a study of the educational progress of a group of pupils who had one term or more of kindergarten training. The primary aim is to measure by objective research the product of the kindergarten in terms of elementary-school progress. The justification for the study is not that it is new, but different, having perhaps more of a scientific nature than previous studies in the same field.

There are those who worship at the shrine of Froebel and others who ardently insist that the kindergarten (in the present form) is but a stumbling block to the educational progress of the pupils who attend it. But neither of these factions attempt to show the effect of kindergarten training in terms of educational accomplishments. Most of the investigators in this field have dodged the issue and sought to justify the kindergarten by saying that the results of successful kindergarten training are shown by the development of such traits as: self-confidence, moral attitude, love of nature, ability to mix, friendliness, interest, attention, ability to think, response, cleanliness, orderliness, oral expression, ability to play, etc. Granting that these are the results of kindergarten training, one can reply that they are also the results of all successful teaching. Hence the benefits of kindergarten training should show in the educational product of the pupil in his grade work. It yet remains to be shown that pupils

[1] My obligations to Superintendent H. B. Wilson of Berkeley, and Dr. V. E. Dickson of Oakland for placing the field for the research at my disposal are so apparent as to need no acknowledgment. Dr. R. H. Franzen, Director of Educational Research, Des Moines, Iowa, has read the manuscript and made valuable suggestions. Thanks are due to other members of the Research Departments, and to the different principals of Berkeley and Oakland for hearty cooperation in opening their files containing the data.

I desire also to express my thanks to Dr. F. W. Hart of the Department of Educational Administration, University of California, for encouragement and suggestions as to method of attacking the problem and collecting the data.

who have the same mental ability, development, and comparable opportunity but who lack kindergarten training will not have developed these traits to the same degree by the end of the first few grades. Until such time as educational measurements and elementary-school practice differentiate between the effect of such characteristics and other phases of educational product, it seems fair to assume that the kindergarten should be justified as a part of our educational system in terms of elementary theory and practice. If it does not meet these requirements it should be justified in other terms befitting such a democratic institution. The question is, Are these institutions kindergartens or hindergartens?

## Method of Procedure

This study has the advantage of two refinements of procedure over former studies in the field. In previous studies the groups have not been entirely comparable because of the different number of cases in each group. In this study the kindergarten group was compared with a non-kindergarten group having exactly the same number of cases. Moreover, identical frequency distributions were also arranged for the two groups on the basis of intelligence quotients derived from the National Intelligence Test.

The control of these two steps in the procedure made it possible to compare the two groups at any stage of progress in the grades without complicated mathematical computations. Moreover, this control tends to equalize factors which are otherwise beyond control. For example, the types of home environment; the influence of the good and the bad elements in the teaching personnel; the influence of the prejudices of first-grade teachers, for and against the kindergarten training; and such factors as the pupil's health, interest, or precocity tend to be equalized by the nature of the selection, the unity of ability, and equal number of cases in each group. Perhaps the truth of this point will be more obvious when the method of collecting the data is considered.

The data for the study were collected in the Berkeley and Oakland schools. The fourteen schools represented in the study

were chosen in consultation with the Departments of Research and Guidance of the respective cities. An effort was made to include the different social strata, and in every way to make the groups as nearly as possible representative of the normal situation. The percent of children of foreign parentage was not large. All the pupils in these schools had been tested and carefully classified by the city research department. Therefore, the results presented here may not hold for morons nor for groups having a large percent of foreign children, handicapped with the problem of learning a new language.

Having thus selected the schools, all pupils included in the study were chosen in accordance with certain requirements. The record card of each pupil chosen showed: (1) his National Intelligence score; (2) that he had completed the fifth grade; and (3) a continuous record of his work in the same school system from the time of school entrance through the fifth grade. These requirements amply insure a random selection.

As a result of this selection, 209 pupils who had attended kindergarten and 228 who had not attended kindergarten, or a total of 437 pupils, became available. Since the National Intelligence Test was not given to all classes on the same date, the scores were reduced to Intelligence Quotients. The frequency distribution was then plotted, and enough cases eliminated to make the frequency distributions of the Intelligence Quotients identical in both groups. To insure a random selection, the cases were eliminated in alphabetical order. Table I shows that 22 cases were eliminated from the kindergarten group and 41 from the non-kindergarten group, leaving 187 in each group, or a grand total of 374. Table I also shows the intelligence distribution of the cases upon which this investigation was made.

With the exception of a couple of small classes the number of kindergarten and non-kindergarten pupils chosen from each class was about the same. Since few families had two children in the same half-grade at the same time, these two groups represent about the same number of homes.

TABLE I. THE DISTRIBUTION OF PUPILS BEFORE AND AFTER ELIMINATION

| Intelligence Quotients | Kindergarten Group | | | Non-Kindergarten Group | | |
|---|---|---|---|---|---|---|
| | Original number | Number eliminated | Final number | Original number | Number eliminated | Final number |
| 65–69.9 | 0 | 0 | 0 | 4 | 4 | 0 |
| 70–74.9 | 1 | 0 | 1 | 5 | 4 | 1 |
| 75– | 4 | 0 | 4 | 5 | 1 | 4 |
| 80– | 7 | 0 | 7 | 10 | 3 | 7 |
| 85– | 5 | 0 | 5 | 14 | 9 | 5 |
| 90– | 21 | 0 | 21 | 26 | 5 | 21 |
| 95– | 25 | 0 | 25 | 30 | 5 | 25 |
| 100– | 30 | 10 | 20 | 20 | 0 | 20 |
| 105– | 30 | 0 | 30 | 30 | 0 | 30 |
| 110– | 20 | 0 | 20 | 26 | 6 | 20 |
| 115– | 22 | 1 | 21 | 21 | 0 | 21 |
| 120– | 14 | 5 | 9 | 9 | 0 | 9 |
| 125– | 10 | 2 | 8 | 8 | 0 | 8 |
| 130– | 5 | 0 | 5 | 7 | 2 | 5 |
| 135– | 5 | 0 | 5 | 5 | 0 | 5 |
| 140– | 3 | 0 | 3 | 4 | 1 | 3 |
| 145– | 5 | 4 | 1 | 1 | 0 | 1 |
| 150– | 2 | 0 | 2 | 3 | 1 | 2 |
| Total..... | 209 | 22 | 187 | 228 | 41 | 187 |
| Mean..... | 108.25 | | 107.61 | 104.65 | | 107.61 |
| S.D. ..... | 15.2 | | 15.25 | 16.5 | | 15.25 |
| $P.E._{m}$..... | 0.71 | | 0.75 | 0.74 | | 0.75 |

## RESULTS

Table I shows that the distribution of the Intelligence Quotients of the final groups form approximately a normal curve ranging from I.Q.'s of 70 to 150, inclusive. The mode is 105 and the mean 107.61 with the standard deviation high, showing a wide range of abilities. Whatever is said of the one group must be said of the other, for the groups are equal in number of cases and in native endowment.

In considering the results it must constantly be recalled that, unless specified to the contrary, the discussion deals always with the results as though all factors involved were controlled (either directly or by variation as indicated elsewhere), so that the groups differ only in kindergarten training and in chronological and mental age, (not in I.Q.) at the time of entering the first grade.

From the figures given in Table II it will be seen that the difference between the total number of half-grades failed and skipped by each group is identical. The kindergarten group skipped 88 half-grades and failed 64—a net gain of 24. The non-kindergarten group skipped 111 half-grades and failed 87—likewise a net gain of 24.

TABLE II. THE NUMBER AND PERCENT OF HALF-GRADES FAILED AND SKIPPED

| Grades | Half-grades failed | | Percent failed[a] | | Half-grade skipped | | Percent skipped[a] | |
|---|---|---|---|---|---|---|---|---|
| | K[b] | NK[b] | K | NK | K | NK | K | NK |
| I-Low | 12 | 20 | 18.7 | 23.0 | 3 | 5 | 3.4 | 4.5 |
| I-High | 12 | 9 | 18.7 | 10.3 | 5 | 3 | 5.7 | 2.7 |
| II-Low | 3 | 11 | 4.7 | 12.6 | 10 | 20 | 11.4 | 18.0 |
| II-High | 9 | 8 | 14.1 | 9.2 | 22 | 21 | 25.0 | 18.9 |
| III-Low | 9 | 9 | 14.1 | 10.3 | 10 | 8 | 11.4 | 7.2 |
| III-High | 3 | 5 | 4.7 | 5.7 | 6 | 12 | 6.8 | 10.9 |
| IV-Low | 4 | 10 | 6.3 | 11.5 | 4 | 10 | 4.6 | 9.0 |
| IV-High | 1 | 1 | 1.6 | 1.2 | 8 | 9 | 9 | 8.1 |
| V-Low | 7 | 8 | 10.8 | 9.2 | 9 | 13 | 10.2 | 11.7 |
| V-High | 4 | 6 | 6.3 | 6.9 | 11 | 10 | 12.5 | 9.0 |
| Total | 64 | 87 | 100.0 | 99.9 | 88 | 111 | 100.1 | 100.0 |

[a] For purposes of comparison only the percents are figured on the total number of half-grades failed and skipped in each group.

[b] In the tables K indicates the final kindergarten group and NK the final non-kindergarten group.

The time which would have been required for each group to complete the first five grades of the elementary school if every pupil had been promoted regularly would have been 187 times 5, or 935 years. The kindergarten group required a total of 923 years, making a gain of 12 years over normal procedure. The total time required for the non-kindergarten group is also 923 years, making an equal gain with the former group. This investigation shows that the kindergarten and non-kindergarten group each completed the five grades at a gain of exactly 12 years.

TABLE III. THE DISTRIBUTION OF PUPILS FAILING AND SKIPPING (HALF-GRADES)

| Intervals in half-grade steps* | Pupils failed | | Pupils skipped | |
|---|---|---|---|---|
| | K | NK | K | NK |
| 0 | 136 | 134 | 120 | 114 |
| 1 | 42 | 31 | 50 | 50 |
| 2 | 6 | 11 | 14 | 14 |
| 3 | 2 | 10 | 2 | 4 |
| 4 | 1 | 1 | 1 | 4 |
| 5 | 0 | 0 | 0 | 1 |
| Total failed or skipped. | 51. | 53. | 67. | 73. |
| Mean | 0.342 | 0.465 | 0.470 | 0.593 |
| S.D. | 0.645 | 0.866 | 0.725 | 0.939 |
| $P.E._m$ | 0.0318 | 0.0427 | 0.0357 | 0.0463 |

* In this column zero means *no half-grade.* Therefore, the pupils entered opposite "0" and under "Pupils failed" are to be thought of as not having failed at all. Similarly, those entered opposite "0" and under "Pupils skipped" did not skip at all.

In Table III the data, given in Table II, are summarized in terms of the half-grade steps "failed" or "skipped." The totals give the number of pupils in each group who did in fact fail or skip one or more half-grades. We find that 51 pupils in the kindergarten group failed 64 half-grades, while 67 pupils in the group skipped 88 half-grades. In the non-kindergarten group 53 pupils failed 87 half-grades, while 73 skipped 111 half-grades. Attention is called to the means and their probable errors as shown in Table III. According to the usual interpretation of these results, 50 percent of the means of like distributions would fall within the probable errors of the mean; e.g., if the investigation were repeated a thousand times in the same way, in five hundred instances the average amount skipped by groups similar to the kindergarten groups (mean equals 0.47) would fall between 0.505 and 0.434. All but three or four of the one thousand means would fall between 0.33 and 0.61 (4 P.E. from the mean). Therefore the results are reliable. At this point the study indicates that the effect of kindergarten training on educational progress measured in terms of grades failed and skipped is nil.

But, this is not the whole story. The number of half-grades failed and skipped within the respective groups is a point of vital importance to both the child and the school administration. Using the totals which appear in Table II, we find that there were 198 failures and skips in the non-kindergarten group as compared with 152 in the kindergarten group.

What caused the greater skipping in the non-kindergarten group which neutralized the greater proportion failing? This question can be answered in part from the information tabulated in Table IV. The pupils of the kindergarten group entered the first grade at an average chronological age of 6 years 2.13 months. Since the non-kindergarten group entered at an average age of 6 years 5.5 months, the difference indicates that this group was chronologically older when it entered the first grade by an average of 3.4 months. The standard deviations from the averages and the quartile deviations show that the spread within the respective groups is far greater for the non-kindergarten group. The extreme range of spread in the kindergarten group (Table IV) is 5 years 6 months to 7 years 1 month; while in the non-kindergarten group it is 5 years 6 months to 8 years 4 months.

As stated above the non-kindergarten group failed a greater number of times than did the kindergarten group. This is perhaps what one would expect as a result of not having had kindergarten training. But the non-kindergarten group also skipped a greater number of times. The greater proportion of skipping was due no doubt to the fact that older pupils in a class tend to be pushed ahead. Hence the great fluctuation in the non-kindergarten group was caused by an abnormal condition of overageness—a condition likely to be characteristic of non-kindergarten groups chosen as this one was. We chose a non-kindergarten group which was just like the kindergarten group in school progress, in potential rate of progress, and in school and home life; and in order to do this *they had to be older.* The high standard deviation in the non-kindergarten group emphasizes this logic. Many were not only too old for the first grade

TABLE IV. THE FREQUENCY DISTRIBUTION OF CHRONOLOGICAL AGES OF BOTH GROUPS AT THE TIME OF ENTERING THE FIRST GRADE

| Ages | | K | NK |
|---|---|---|---|
| Years | Months | Frequency | Frequency |
| 5 | 6 | 3 | 1 |
| | 7 | 5 | 1 |
| | 8 | 5 | 4 |
| | 9 | 10 | 11 |
| | 10 | 12 | 8 |
| | 11 | 21 | 10 |
| 6 | 0 | 23 | 22 |
| | 1 | 23 | 10 |
| | 2 | 19 | 16 |
| | 3 | 15 | 7 |
| | 4 | 11 | 12 |
| | 5 | 8 | 8 |
| | 6 | 10 | 12 |
| | 7 | 8 | 7 |
| | 8 | 4 | 3 |
| | 9 | 3 | 9 |
| | 10 | 3 | 9 |
| | 11 | 2 | 8 |
| 7 | 0 | 1 | 6 |
| | 1 | 1 | 1 |
| | 2 | 0 | 8 |
| | 3 | 0 | 3 |
| | 4 | 0 | 2 |
| | 5 | 0 | 1 |
| | 6 | 0 | 3 |
| | 7 | 0 | 1 |
| 8 | 1 | 0 | 2 |
| | 3 | 0 | 1 |
| | 4 | 0 | 1 |
| | | 187 | 187 |
| Mean | | 6–2.13 | 6–5.5 |
| S.D | | 3.79 | 6.47 |
| $P.E._m$ | | 0.187 | 0.318 |
| $Q_1$ | | 5–11.56 | 6–0.53 |
| $Q_3$ | | 6–4.39 | 6–8.92 |
| Q | | 2.42 | 3.7 |

but much too old. A glance at the lower half of Table IV will verify this.

As stated above, the average difference between the chronological ages of the two groups at the time of entering the first grade was 3.4 months. That is, on the average each non-kindergarten pupil was more than three months older than his corresponding kindergarten pupil. Since both groups completed the

work of the first five grades in the same length of time, obviously the kindergarten group completed the work at a younger age. It will be noted (Table V) that the kindergarten group spent an average of 1.78 terms or 7.89 months in kindergarten training. The fact, however, remains that the group which had the kindergarten training completed the five years of elementary work at a younger age by an average of 3.4 months, and this with very similar results (see Table VI) in scholarship and in deportment as measured in terms of teachers' marks.

These groups had the same I.Q. which means they were probably born with equal mental capacities. But this must not be construed to mean that they entered the first grade with equal mental development. They were not equal in the kind of training, nor in chronological age and hence not in mental age. The one group had received kindergarten training, the other was older

TABLE V. THE DISTRIBUTION OF KINDERGARTEN ATTENDANCE BY HALF-YEARS

| Half-year terms | Number of pupils attending | Terms attended |
|---|---|---|
| 1 | 73 | 73 |
| 2 | 87 | 174 |
| 3 | 23 | 69 |
| 4 | 4 | 16 |
| Total..... | 187 | 332 |

Average number of terms attended kindergarten 1.78 or 7.89 months.

TABLE VI. MEDIANS OF TEACHERS' MARKS IN SCHOLARSHIP AND DEPORTMENT FOR THE FIVE-YEAR PERIOD

| Ranking* | Scholarship | | Deportment | |
|---|---|---|---|---|
| | K | NK | K | NK |
| E | 27 | 30 | 31 | 42 |
| G | 64 | 58 | 121 | 108 |
| S | 72 | 70 | 29 | 30 |
| P | 24 | 29 | 6 | 7 |
| F | 0 | 0 | 0 | 0 |
| Totals..... | 187 | 187 | 187 | 187 |

* E—Excellent, G—Good, S—Satisfactory, P—Poor, F—Failed.

and hence possessed the experience resulting therefrom. The two groups, thus different, did the same task, in the same time. The kindergarten group did the work with less irregularity, with similar credit and at a younger age. Obviously, the experience of the kindergarten training matched the greater experience, due to age, possessed by the non-kindergarten group. Had the latter group just equaled the kindergarten group in chronological age at the time of entering the first grade, the kindergarten would have shown itself superior in educational progress.

Thus, the uncontrolled factor of age caused the difference to show in the saving of chronological age, the average difference in which was 3.4 months. The kindergarten group saved or gained about 53 years of human life (187 times 3.4 months). The investigation shows that children trained in the kindergarten can make the same progress as older children not so trained—all other things being equal. It follows logically, that a kindergarten group will proceed faster than a group of the same age and intelligence not having had kindergarten training. Therefore the kindergarten expedites school life. Intelligence, being constant, kindergarten training makes it possible to meet the first-grade situation at an earlier age. When we are able to control the age factor the gain will show directly in educational progress in the elementary grades.

# THE READING VOCABULARIES OF THIRD-GRADE CHILDREN

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In June 1919 the textbook commission for the state of Oregon met and adopted the textbooks to be used in the public schools for a period of six years. In order to understand better the textbooks thus adopted, a group of advanced and graduate students undertook a number of studies in connection with a course on the Elementary Curriculum offered by the writer at the University of Oregon. One of the studies thus undertaken was an attempt to determine the minimum reading vocabularies of third-grade children.

The reading vocabularies were considered minimum vocabularies if they barely met the minimum requirements of the state course of study. Of course, practically every third-grade child in the state would come in contact with words in supplementary readers, on charts, and in other reading material which were not found in the prescribed books. These words would appreciably increase his reading vocabulary.[1]

While the general purpose of the study was to determine the minimum reading vocabulary of third-grade children, more specifically, the purpose was (1) to determine the gross number of words in the reading and spelling vocabularies of third-grade pupils; (2) to note the rapidity of growth in these vocabularies from year to year; (3) to determine the frequency of the various words; and (4) to determine the correlation existing between the vocabularies in the various textbooks used.

The prescribed books to be placed in the hands of the pupils for the first three grades with the number of pages the child is required to read and the order in which the work shall be presented as prescribed by the state course of study are as follows:

[1] The final scoring and re-checking of the words was done by Miss Ruth Chase of the Omaha Public Schools, Omaha, Nebraska. To her belongs the credit for the careful scoring of these books.

1. Beacon Primer . . . . . 124 pages
2. Natural Primer . . . . . 122 pages
3. Beacon First . . . . . 130 pages
4. Natural First . . . . . 136 pages
5. Natural Second . . . . . 256 pages
6. Natural Third . . . . . 304 pages
7. Hamilton's Essentials of Arithmetic. . . . . to page 124
8. The New World Speller, Reading Vocabulary, to page 136
9. The New World Speller, Spelling Vocabulary, to page 136

The words in the New World Speller were divided in two parts since the child must do considerable reading in this text as well as learn to spell the words. While the words he is required to spell are scored separately from the reading words in the speller, they were counted in making up the total list of words in his reading vocabulary since he would have these words in his reading vocabulary the same as the others.

*Terms used in the study.*—The term, "Different Words," means the total number of separate words used in each book; "New Words" means words used for the first time. For instance, all the different words used in the Beacon Primer are new words because this was the first book the pupil was to use upon entering school. "Used Words" are words which have occurred in earlier books. The Natural Second Reader, (book No. 5 above) contains 1770 different words of which 861 are *new* and 909 are *used*. "Running Words" means the number of times all the words occur. If, for instance, 12 different words were found and the sum of their frequencies was 49, then the number of running words would be 49.

*Method of procedure.*—Every word in each book was counted and listed with the number of times it was used in that book. The plural, the singular, and different spellings of a word were counted as different words. For example, the words, lady and ladies, man and men, were each counted as different words. A proper name, Mary Jones, was counted as two words rather than one.

No subject matter was counted unless the child was required to read or spell it. Hence, all notes and directions for teachers were omitted. Since the Hamilton Arithmetic and the New World Speller were not completed in the third grade, only those pages designated by the state course of study were used in determining vocabularies. The words were listed alphabetically with their frequencies in each textbook. The total frequencies for the nine books are given in Table I.

TABLE I. THE TOTAL FREQUENCIES OF THE WORDS FOUND IN THE PRESCRIBED TEXTBOOKS

| | Different words | New words | Used words | Running words |
|---|---|---|---|---|
| Beacon Primer | 743 | 743 | 0 | 7,007 |
| Natural Primer | 503 | 238 | 265 | 6,315 |
| Beacon First | 804 | 395 | 409 | 8,455 |
| Natural First | 849 | 265 | 584 | 8,878 |
| Natural Second | 1,770 | 861 | 909 | 25,332 |
| Natural Third | 3,304 | 1,888 | 1,416 | 34,855 |
| Hamilton's Arithmetic | 1,282 | 529 | 753 | 12,574 |
| New World Speller (reading) | 450 | 58 | 392 | 2,705 |
| Total (Reading) | 9,704 | 4,977 | 4,728 | 106,121 |
| New World Speller (Spelling vocabulary) | 1,453 | 213 | 1,240 | 6,767 |

*A summary of the data.*—An analysis of the data reveals the following significant facts:

1. The minimum reading vocabulary of third-grade children who meet the minimum requirements of the state course of study is 5,190 different words. This number is made up of 4,977 words in the regular reading vocabulary and 213 additional words that a child is called upon to spell, which would, of course, be in his reading vocabulary.

2. About one-seventh of the words in a child's spelling vocabulary (213 out of 1,453) are not found in that form in the regular reading vocabulary. In almost every case, however, some form of the words occur in the readers. For example, the word *armchair* does not occur in the readers but the words *arm*

and *chair* occur many times. The word *bitter* is not found in the readers but the word *bitterly* occurs twice.

3. There are 289 words which occur 50 or more times in the reading vocabulary. Of the 106,121 running words in the regular reading vocabulary, these 289 are used 75,591 times. Or, in other words, 289 words constitute 71.2 percent of the running words used in these textbooks. The 289 words constitute 5.8 percent of the words in the reading vocabulary.

4. The average number of times each of the 4,977 words is used is 21.3.

5. The 289 words occur on an average of 261 times.

6. Of the total number of different words, 1,470 occur but once.

7. In the speller, 1,453 words are listed 6,767 times or an average of 6.4 times.

8. The fifty words most often used are given in Table II.

TABLE II. THE FIFTY WORDS MOST FREQUENTLY USED IN THE PRESCRIBED TEXTBOOKS

| Word | Frequency | Word | Frequency | Word | Frequency | Word | Frequency |
|---|---|---|---|---|---|---|---|
| 1. the | 7267 | 14. that | 857 | 27. but | 539 | 40. up | 419 |
| 2. and | 3142 | 15. little | 857 | 28. my | 539 | 41. me | 413 |
| 3. to | 2441 | 16. she | 792 | 29. there | 534 | 42. out | 413 |
| 4. a | 2336 | 17. they | 725 | 30. with | 529 | 43. were | 410 |
| 5. he | 1790 | 18. his | 721 | 31. as | 528 | 44. see | 399 |
| 6. of | 1714 | 19. for | 705 | 32. has | 526 | 45. can | 392 |
| 7. I | 1629 | 20. on | 661 | 33. at | 521 | 46. him | 385 |
| 8. in | 1473 | 21. all | 637 | 34. then | 521 | 47. come | 370 |
| 9. you | 1385 | 22. how | 632 | 35. what | 508 | 48. very | 366 |
| 10. was | 1069 | 23. so | 618 | 36. are | 506 | 49. by | 365 |
| 11. said | 948 | 24. will | 591 | 37. one | 495 | 50. then | 365 |
| 12. it | 927 | 25. her | 558 | 38. have | 453 | | |
| 13. is | 900 | 26. not | 549 | 39. when | 424 | | |

This list of words of greatest frequency contains 35 of the 50 words of greatest frequency found in the Ayres Spelling Scale.

9. The first 13 words in Table II are the same as the first 13 words in the Ayres list of 1,000 commonest words with the exception of the eleventh word in the list. In the Ayres list the word, *that*, occurs instead of the word, *said*.

10. These 13 words constitute 25.8 percent of the running words in the third-year reading vocabulary.

11. Of the whole number of words in the reading vocabulary, 29.5 percent, or nearly one-third occur but once.

## Conclusions

The reading vocabularies of third-grade children are much larger than is generally supposed by primary teachers and supervisors. If one or two supplementary readers are used in the grades, and additional reading is done in such subjects as elementary history, physiology and hygiene, geography, etc., it would seem that 6,000 words would be a very conservative estimate for third-grade reading vocabularies.

There is a high correlation between the words used in the readers and those found in the speller and arithmetic.

The fact that 29.5 percent of the words have been seen but once by the children who have advanced as far as the fourth grade may be one of the important causes why some children read so poorly and fail to recognize these words when they meet them again in the upper grades.

The frequency with which the various words occur should be a valuable factor in determining what ought to be expected of children in these grades.

# A TEXTBOOK SCORE CARD

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The problem of selecting and adopting textbooks has always been difficult, and little has been done to effect a scientific solution. We find haphazard and slipshod methods both in selecting the committee and in judging the books. In some cases the superintendent chooses the texts, in others a committee of teachers, and in still others board members. In any event, practically no systematic plan is used to judge the value of the textbook. Instead, the arguments of a salesman, the prejudice of a superintendent, or the favoritism of a board member is allowed to settle the important matter of adopting a book which, in many cases, will be used five or ten years, and which may involve the expenditure of thousands of dollars. This situation exists in practically all of the states. There ought to be an improvement both in the judging of books and in the way they may be adopted by the board. With this idea in mind the writer has attempted to work out a plan which will at least be superior to those in use at present.

The data used in formulating this plan were collected and arranged during a recent summer session. The original paper included a plan for the adoption of textbooks, which will not be considered at the present time. The complete card was worked out through the guidance of instructors and may be too detailed for the average superintendent to use. For this reason a simpler and shorter one has been given with the more fundamental characteristics only. As to the score card, suggestions, criticisms, and weightings were made by two classes numbering more than a hundred teachers, principals, supervisors, and superintendents.

At the time the score card was planned little had been done along this line. In a few instances cards had been devised for separate subjects, but none of a general nature could be found. In those to which the writer had access the items were not

weighted. In fact, these devices were mere outlines to guide the reader in his estimate of the value of a book. Some of them were arranged by school men, others by book companies.

The best general discussion on judging textbooks was found in Hall-Quest's treatise. With suggestions from this source and from those mentioned above, combined with analyses of scores of the newest textbooks on exhibition near the university, the characteristics which appear in the present card were adopted as applicable to the ordinary textbook in the average school.

The limitations of this device are obvious. It is designed primarily for informational books. Histories, geographies, readers, science textbooks, and the like can easily be scored by it. On the other hand, some of the items do not apply to language texts, spellers, and arithmetics. It should be borne in mind, however, that books of this type are beginning to include more content material as distinct from drill material. For them, therefore, characteristics which are sought in informational books are becoming more and more appropriate. Moreover, in the use of the score card entire sub-divisions may be omitted without altering the relative scores of books submitted by different companies. This fact makes possible a further adaptation of the score card to different types of books.

## TEXTBOOK SCORE CARD

(Condensed Form)

| | |
|---|---|
| 1. LOCAL ADAPTABILITY | 110 |
| A. Supervision | ( 20) |
| B. Teaching | ( 25) |
| C. Children | ( 30) |
| D. Class | ( 10) |
| E. Equipment | ( 20) |
| F. Term | ( 5) |
| 2. SUBJECT MATTER | 400 |
| A. Child Experience | ( 65) |
| B. Aims | ( 50) |
| C. Individual Differences | ( 45) |
| D. Selection and Balance | (100) |
| E. Moral-Civic Values | ( 65) |
| F. Reliability | ( 35) |
| G. Style | ( 40) |

3. Arrangement and Organization..... 120
   A. Divisions . . ..... ( 40)
   B. Project Method . . ..... ( 80)
4. Aids to Instruction and Study..... 170
   A. Usableness . . ..... ( 90)
   B. Provision for Choice..... ( 50)
   C. Index . . ..... ( 10)
   D. Glossary . . ..... ( 10)
   E. Contents (table) . . ..... ( 10)
5. Mechanical Features . . ..... 150
   A. Attractiveness . . ..... ( 25)
   B. Illustrations . . ..... ( 45)
   C. Print . . ..... ( 30)
   D. Binding . . ..... ( 25)
   E. Paper . . ..... ( 25)
6. Special Features . . ..... 50
   A. Authorship . . ..... ( 30)
   B. Publisher . . ..... ( 5)
   C. Preface . . ..... ( 5)
   D. Publication (date) . . ..... ( 10)

   Total . . .....1000

In using the score card, especially in its condensed form, one needs a definition and explanation of the headings. Only when these headings are understood in the same way by different people can the purposes of this plan of judging the textbooks be accomplished. The meaning therefore of the items of the card is briefly indicated in the following "Standards."

## STANDARDS FOR SCORING TEXTBOOKS

1. Local Adaptability. Is the book suited to the locality?

*A. Supervision.*—Adapted to the type of supervision. Should be self-directive. Requires minimum of attention on the part of the supervisor. Suited to the course of study likely to be used for a considerable period.

*B. Teaching.*—Suited to various types of instruction. Gives special aid to inexperienced teachers. Adaptable to conservative teachers using formal recitation. Enables progressive teachers to use initiative.

*C. Children.*—Adapted to needs and ability of children. Should relate community activities to school work. Should have material for both sexes.

*D. Class.*—Suited to size of class, whether large or small. Meets needs of group of poorly classified pupils.

*E. Equipment.*—Meets restrictions of a modestly equipped laboratory, a small library, and a minimum of supplies.
*F. Term.*—Essential material for short term with extra topics for longer.

2. SUBJECT MATTER. What is the character of it?
*A. Child Experience, Related to.*—Interests the child. Builds on original tendencies. Recognizes play instinct. Provides for dramatization. Allows growth in subject and in life.
*B. Aims.*—Meets local requirements of course. Is in harmony with accepted general aims. May be adapted to laboratory, library, or recitation methods.
*C. Individual differences, Provides for.*—Offers material for slow, gifted, and normal pupils. Sufficient breadth to appeal to literary, scientific, linguistic, or historical tastes.
*D. Selection and balance.*—Are they recognized: (1) in amount given to a topic, (2) in selection of essential topics, (3) in repetition of vital facts when needed, and (4) in elimination of unnecessary repeating especially in series of books? Less important topics in different type.
*E. Moral-civic values.*—Suggests ideals of conduct and action. Has civic and moral motive. Does not encourage prejudice. Teaches suspension of judgment. Promotes loyalty and Americanism.
*F. Reliability.*—Facts and forms accurate and up-to-date. Material from authentic sources.
*G. Style.*—Language and diction suitable for grade or class. Simple in earlier years, gradually increasing in sentence and word difficulty. Emphasizes short sentence. Language figurative and vivid where possible.

3. ARRANGEMENT AND ORGANIZATION.
*A. Divisions.*—Divided carefully into chapters, sections, and paragraphs, each attractively set off in bold faced type, larger letters, or special print groupings. Divisions characterized by unity and continuity. Lessons have aims that are clear and definite.
*B. Project Method.*—Adapted to this method. Material topically grouped. Easily correlated with other branches. Provides for unit studies. Applications suggested or presented and carefully distributed through text.

4. AIDS TO INSTRUCTION AND STUDY.
*A. Usableness.*—Questions thought provoking and relevant. Suggested methods of study. References well-selected and annotated. Exercises useful and bearing on text. All planned with a view to purposeful activity.
*B. Provision for Choice.*—Sufficient number. Variation in difficulty and interest.

*C. Index.*—There should be an adequate index, and where possible, a list of difficult pronunciations, or words parenthetically pronounced.

*D. Glossary.*

*E. Contents.*—Table of contents complete enough to permit ready location of important topics.

5. MECHANICAL FEATURES.

*A. Attractiveness.*—Color suitable, not easily soiled. Design harmonious. Size convenient.

*B. Illustrations.*—Adequate in number, useful, appealing to pupil, full of action when possible, well-executed, explanation in detail.

*C. Print.*—Proper size for grade. Height at least 1.5 mm, thickness 0.25-0.3 mm; between letters 0.5-0.75 mm; within letters 0.3-0.5 mm; between words 2 mm; between lines 2.5 mm. For young pupils, first year.

*D. Binding.*—Durable and flexible, not easily broken.

*E. Paper.*—Good weight, good quality, surface unglazed.

6. SPECIAL FEATURES.

*A. Authorship.*—Author prominent as educator, authority in subject.

*B. Publisher.*—Reliable, of good standing and reputation.

*C. Preface.*—Serves real use. Gives general plan of book.

*D. Date of publication.*—Revised or produced in the last five years.

# A STUDY OF THE USE OF THE STANFORD REVISION OF THE BINET-SIMON TEST AS A GUIDE TO SELECTION OF HIGH-SCHOOL COURSES

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This study was made in a school located in the downtown section of Spokane where hotels and lodging and apartment houses furnish homes for a transient population. Only twelve pupils in the VIII-A class under discussion had been enrolled in this school before grade VII. Four pupils entered the school in VIII-A. Very great differences in ability, habits, training, and knowledge of subject matter were bound to exist under these conditions.

In June, 1920, I gave the Stanford Revision of the Binet-Simon Test to the members of the VIII-A class. On the basis of mental age and intelligence quotient, I helped each pupil to select his course for high school. Before making my suggestions I tried to find out the things in which each student was interested and his plans for the future. In all cases where the student expressed a preference for a subject, I agreed if it seemed to be within the ability of the child as disclosed by the Stanford Revision. In those cases where the pupil's choice was not wise or seemed too difficult for successful accomplishment, I recommended subjects I thought more suitable. All but one took the work I advised.

At the close of the first semester in high school, I was furnished with a copy of the grades earned by the class. These grades, together with their VIII-A grades, their scores on the Otis group test (which I gave in May), and the VIII-A teacher's estimate of ability, may be of some value in determining to what extent I was justified in using the Stanford Revision as a guide in recommending high-school courses. The reader is referred to Table I for details concerning these pupils.

In the class of thirty children seven failed to make the required four credits. Two of these, however, followed exactly the courses I had advised, and they received credit for all the work

TABLE I. AGE, INTELLIGENCE TEST SCORES, AND HIGH-SCHOOL RECORDS OF THE PUPILS IN THE CLASS OF JUNE, 1920

| Pupil | Chronological Age | Mental Age | Intelligence Quotient | Otis Score | Average Ratings | | Credits Earned in H. S. |
|---|---|---|---|---|---|---|---|
| | | | | | VIII-A | High School | |
| 1 | 11–4 | 17–10 | 157 | 159 | 90 | 92 | 4 |
| 2 | 14–1 | 18–9 | 133 | 156 | 89 | 85 | 4 |
| 3 | 12–6 | 15–8 | 125 | 153 | 88 | 90 | 4 |
| 4 | 13–2 | 16 | 121.5 | 169 | 82 | 88 | 4 |
| 5 | 13–2 | 15–9 | 119.6 | 145 | 91 | 94.5 | 4 |
| 6 | 14–6 | 16–9 | 115.5 | 155 | 86 | 88 | 4 |
| 7 | 14–3 | 16–5 | 115 | 123 | 89 | 80 | 4½ |
| 8 | 13 | 14–8 | 112.8 | 158 | 90 | 91 | 4 |
| 9 | 13–7 | 15–3 | 112 | 147 | 81 | 82 | 4 |
| 10 | 13–3 | 14–10 | 111.9 | 159 | 79 | 89 | 4 |
| 11 | 13–9 | 15–1 | 109.7 | 166 | 89 | 88 | 4 |
| 12 | 14 | 15–4 | 109.5 | 150 | 92 | 84 | 4 |
| 13 | 13–6 | 14–8 | 108.6 | 127 | 85 | 87 | 4 |
| 14 | 14–2 | 15–4 | 108 | 127 | 82 | 74 | 2 |
| 15 | 14–9 | 15–2 | 102.8 | 154 | 88 | 79 | 3 |
| 16 | 15–5 | 15–7 | 101 | 152 | 85 | 87 | 4 |
| 17 | 14–9 | 14–10 | 100.5 | 103 | 84 | 84.5 | 4 |
| 18 | 13–9 | 13–6 | 98 | 147 | 91.5 | 88.5 | 4 |
| 19 | 15–3 | 14–8 | 96 | 146 | 93 | 88 | 4 |
| 20 | 13–10 | 13–4 | 96 | 136 | 92 | 81.5 | 4 |
| 21 | 13–7 | 13–1 | 96 | 118 | 85 | 77.5 | 3 |
| 22 | 15–6 | 14–10 | 95 | 135 | 87 | 79 | 4 |
| 23 | 14–10 | 14–1 | 94.9 | 133 | 81 | 82 | 4½ |
| 24 | 14–6 | 13–9 | 93 | 124 | 86 | 87 | 4 |
| 25 | 16 | 14–7 | 91 | —[a] | 87 | 69 | 1 |
| 26 | 14–6 | 13–1 | 89 | 96 | 83 | 81½ | 4 |
| 27 | 14–3 | 12–5 | 87 | 99 | 87 | 88 | 4 |
| 28 | 15–10 | 13–6 | 85.5 | 127 | 86 | 78 | 3 |
| 29 | 15–2 | 11–5 | 75 | 84 | 84 | 80 | 3½ |
| 30 | 16–9 | 11–11 | 74 | 84 | 64 | 87 | 3½ |

[a] Absent.

they attempted. They were Numbers 29 and 30 (see Table I and Case Studies). The justification for recommending that less than four units of work be adopted by these two pupils rested upon the evident fact of their inferior mentality coupled, especially in the case of Number 30, with unusually late entrance into high school.

Number 25, (C.A., 16; M.A., 14-7; I.Q., 91) selected her own course. She made one credit. Her VIII-A teacher's rating

of "bright, capable" is not easily understood and does not seem prognostic of grades 76 in bookkeeping, 70 in science, 60 in history, and English dropped.

Number 14[1] had scarlet fever during the semester, which may account for his two credits, barely earned, although his teacher's characterization "lazy" may tell the real cause. Number 15 failed in bookkeeping. Number 21 failed in general science, but passed in bookkeeping. Number 28 was absent when the test was given in commercial arithmetic and earned only three credits.

Number 1[1], Number 3, and Number 5 were given the Stanford Revision after they had finished six weeks in VIII-B. The mental age, industry, and understanding of subject matter possessed by each of these pupils seemed to warrant a trial in VIII-A. The teachers assigned lessons to bridge the gap and gave help when necessary. These pupils finished VIII-A very cerditably, and their high-school grades of 90 or above in each subject entitled two of them (Numbers 5 and 1) to places on the "very honorable roll," a distinction not shared by anyone else in the class. Number 3 missed the coveted honor by only two points, having 88 in general science.

Of those taking regular courses, Number 10 (C.A., 13-3; M.A., 14-10; I.Q., 111.9) showed the greatest improvement in high-school average over VIII-A average. This improvement amounted to ten points. Her mental age as well as her Otis score of 159 made her VIII-A average of 79 seem inexcusable. Her VIII-A teacher said she had a "peculiar personality and was lazy unless especially urged." She was untidy, awkward, and reticent, and seemed very indifferent about her work.

According to Table I, the range of intelligence quotients is from 157 to 74, or 83 points. The range of Otis scores is from 169 to 84, or 85 points; that of VIII-A averages from 93 to 64, or 29 points; and that of high-school averages from 94.5 to 74, or 20.5 points. The high-school averages seem to indicate that

[1] For chronological age, mental age, intelligence quotient, etc., for these pupils see Table I and the section, Case Studies.

the courses chosen were within the abilities of the students. The highest VIII-A averages were given to Number 19, (C.A., 15-3; M.A., 14-8; I.Q., 96; Average, 93), Number 20, (C.A., 13-10; M.A., 13-4; I.Q., 96; Average, 92), and Number 18, (C.A., 13-9; M.A., 13-6; I.Q., 98; Average, 91.5). It will be noticed that each of these students has an intelligence quotient less than 100, while seventeen have intelligence quotients over 100, four of them being over 120. In high school Number 19's average was 87.75; Number 20's, 81.5; Number 18's, 88.5.

Number 24 (C.A., 14-6; M.A., 13-9; I.Q., 93) made a better high-school average than Number 2 (C.A., 14-1; M.A., 18-9; I.Q., 133). It is true that their courses were somewhat different, but two subjects—namely, English and general science—were taken by both. Number 24 had 88 in English and 84 in general science, and Number 2, 82 in English and 84 in general science.

Using the averages as means of comparison of the VIII-A and IX-B work, we observe that the average of the high-school averages is 84 and the median 86. The average of the VIII-A averages is 86 and the median 88.

I did not give the intelligence test to the classes entering high school in January, 1920, and January, 1921; but I helped the pupils to select courses, using for the purpose their VIII-A ratings and their teachers' estimates of ability. The general high-school average earned by the January 1920 class was 73, while the general average of the same pupils when in VIII-A was 89. The general high-school average of the January 1921 class was 80 as compared with a general average of 85 when these pupils were in grade VIII-A. The range of 16 points between the high-school and VIII-A averages in the January 1920 class may be due to the fact that a substitute teacher finished the last six weeks in VIII-A and was probably too lenient in her grading. But the range of 5 in the class of 1921 is more than twice that of the class that selected courses on the basis of the Stanford Revision.

In Table II, it will be seen that only two pupils in the class of June 1920 made grades below 70. There were nine such

failures in the January 1920 class and five in the class of January 1921. One pupil in the latter class fell below 70 in both algebra and science. In the class of January 1920 three pupils made less than 70 in two subjects.

A study of the results in history shows that in the June 1920 class four made 90 or above, while in the January 1920 class three made less than 70 and none made 90. In January 1921 only one made 90. In algebra eight pupils, or 42 percent, in the June 1920 class made more than 90, and none were below 70;

TABLE II. DISTRIBUTION OF PUPILS BY CLASSES, SUBJECTS, AND RATINGS

| Subject | Number making less than 70 | | | Number making 70–79.9 | | | Number making 80–89.9 | | | Number making 90–99.9 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Year | | | Year | | | Year | | | Year | | |
| | Jan. 1920 | June 1920 | Jan. 1921 | Jan. 1920 | June 1920 | Jan. 1921 | Jan. 1920 | June 1920 | Jan. 1921 | Jan. 1920 | June 1920 | Jan. 1921 |
| English | 0 | 0 | 0 | 6 | 5 | 9 | 9 | 18 | 7 | 1 | 6 | 2 |
| Algebra | 3 | 0 | 3 | 5 | 6 | 2 | 6 | 5 | 6 | 1 | 8 | 2 |
| Household Arts | 0 | 0 | 0 | | 0 | | 4 | 4 | 3 | 1 | 0 | |
| Shop Drawing | 0 | 0 | 0 | 0 | 0 | 1 | 3 | 2 | 3 | | 0 | |
| Bookkeeping | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 5 | 2 | | 0 | |
| Gen. Science | 1 | 0 | 2 | 3 | 10 | 5 | 1 | 11 | 4 | 1 | 4 | 2 |
| Arithmetic | 0 | 1 | 0 | 0 | 3 | 1 | 0 | 2 | 2 | | 0 | |
| History | 3 | 0 | 0 | 1 | 1 | 0 | 0 | 2 | 5 | | 4 | 1 |
| Latin | 1 | 0 | 0 | | 0 | | 0 | 3 | 3 | | 4 | 2 |
| Spanish | 0 | 0 | 0 | | 0 | | | 0 | | | 1 | |
| Penmanship | 0 | 0 | 0 | 1 | 0 | 0 | 5 | 1 | 0 | | 2 | |
| Printing | 0 | 0 | 0 | | | | 0 | 1 | 0 | | 2 | |
| Special free-hand drawing | 0 | 0 | 0 | | | | 3 | 0 | 0 | | | |
| French | 1 | 0 | 0 | | | | | 1 | | | | 2 |

while three in each of the other classes fell below 70. Less difference is seen in general science. The only two who fell below 70 in any subjects in the class of June 1920 were Number 25, who failed in commercial arithmetic which she took contrary to my advice, and Number 15 who had 69 in bookkeeping.

A study of Table II shows that the quality of work done in high school by the class which was directed on the basis of the Stanford Revision was decidedly superior to the work of the two classes not so guided. The work of Number 25 is a startling

commentary on the pupil's judgment in selection. I had advised the household arts course for her. Her mental age (14-7) seemed to show maturity equal to that required for IX-B students, but her intelligence quotient of 91 and her indifferent attitude toward school work led me to think she would benefit most from a practical course. She insisted, however, on taking courses of her own selection—English, science, and bookkeeping. She passed but one subject, namely, bookkeeping, and in that her rating was only 76.

These few cases are typical of the pupils generally found in my VIII-A class. Perhaps one semester's work may not seem to be a conclusive argument in favor of basing high-school work on the abilities disclosed by the Stanford Revision, but the success of this experiment is encouraging enough to warrant its repetition.

## Case Studies

A few case studies may serve to illustrate the different abilities and opportunities of the pupils in the class under discussion.

*Number 1* (C.A., 11-4; M.A., 17-10; I.Q., 157) is fortunate in her parents who are graduates of well-known universities and take an active part in the civic and social life of the city. She had private lessons in French, music, and public speaking during her last three years in the grades. She finished the eighth grade in one semester. She seldom volunteered an answer but when called on was always ready to give most comprehensive replies. She played with girls of her own age with great pleasure, but suffered no embarrassment in her association with the pupils in her class. She has never spent much time outside of school studying school lessons, but has maintained the high rank in her class which is to be expected from her unusual I.Q. I advised the classical course since she will go to college. English, algebra, and Latin are required in this course, and she chose history as her elective. Her ratings in these subjects were: English, 91; algebra, 92; Latin, 92; and history, 92.

*Number 2* (C.A., 14-1; M.A., 18-9; I.Q., 133) was idle or playing pranks much of the time. His excuse, always forthcoming, was that he knew his lessons. His mother kept a little grocery store and depended upon him to stay in it after school. In consequence, he was never allowed to attend any school festivities nor to take part in any kind of athletics. His mother had had him examined by a physician who gave an unfavorable report in the boy's presence. The belief that he would not live long seemed to influence his attitude toward study. His high-school

grades show his continued lack of effort. When he found himself alive and well, however, at the end of IX-B he settled down to work, and at the end of his freshman year, he was on the "very honorable roll," happy in his work, and planning for college. He took the course which I advised with the following marks: algebra, 82; English, 82; Latin, 92; and general science, 87.

*Number 3* (C.A., 12-6; M.A., 15-8; I.Q., 125) loves school and did II-A and III-B in one semester under his II-A teacher. He did less than six weeks' work in IV-A because his teacher found him troublesome. He had his lessons finished long before she was ready to give him more work. He hated her cordially and she could see no good in him, so I put him in V-B where he worked well and happily. He is mentioned above as an extra promotion from VIII-B. He took the courses I advised and had 90 in both English and algebra, 92 in Latin, and 88 in general science.

*Number 7* (C.A., 14-3; M.A., 16-5; I.Q., 115) is alert and in VIII-A was a good student, always anxious to talk and to take a prominent part in class work. Her high-school average is 9 points lower than she obtained in VIII-A due, at least in part, to the enthusiastic social interests which she developed in high school. She will have to earn her living just as soon as she can. Her I.Q. indicates that she can become efficient in commercial work. She took English, arithmetic, general science, and bookkeeping as I advised. Her high-school grades were: English, 83; arithmetic, 78; general science, 77; and bookkeeping, 82.

*Number 14* (C.A., 14-2; M.A., 15-2; I.Q., 108) had no definite plans or tastes so I advised the general course which does not require Latin and allows two electives. He received 72 in English and 75 in both algebra and history.

*Number 15* (C.A., 14-9; M.A., 15-2; I.Q., 102) although an orphan, has had a fairly good home with a relative. He likes to talk and volunteers constantly. His VIII-A teacher considered him a good worker. His failure in bookkeeping seems unnecessary, but with his customary glibness he ascribed it to the fact that the teacher was no good. He has been brought up in hotels which his guardians have managed, and he expects to do similar work. A commercial course seemed the best for him. He took English, bookkeeping, general science, and arithmetic. He received 83 in English, 69 in bookkeeping, 80 in general science, and 85 in arithmetic.

*Number 18* (C.A., 13-9; M.A., 13-6; I.Q., 98) has a twin sister with an I.Q. of 88 who is in the grade below him. His unusual industry enabled him to do excellent VIII-A work, and satisfactory high-school work. He was eager to take Spanish, which with English, algebra, and general science I approved. His marks for the first semester were: English, 85; algebra, 85; general science, 92; and Spanish, 92.

*Number 21* (C.A., 13-7; M.A., 13-1; I.Q., 96) was quiet, dreamy, rather unreliable in character. The boys did not like him and seldom included him in their games. Since he expects to assist his father in

a mercantile business when he leaves high school, I advised English, bookkeeping, general science, and arithmetic. He accepted my advice. His grades were 80 in English, 80 in bookkeeping, 72 in general science, and 78 in arithmetic. His failure in general science was not a surprise, as his VIII-A work had been done under constant prodding.

*Number 23* (C.A., 14-10; M.A., 14-1; I.Q., 94.9) is the son of a widow who earns a living for her three children by cooking in a restaurant. He was very untidy, often ill, and seldom prepared; but he managed to finish VIII-A with an average of 80. In the high school, he developed an amazing amount of neatness, played in the orchestra, and earned an average of 82. He took the course which I selected with the following marks: English, 87; algebra, 81; manual arts, (shop and drawing), 88; general science, 75; and orchestra, 80.

*Number 26* (C.A., 14-7; M.A., 13-1; I.Q., 89) has been allowed to go and to do very much as she pleases. She is flighty and silly, very fond of boys, and only studies when she likes the subject. In the Otis test she made a score of 96, next to the lowest in the class. I approved English, algebra, and history which she took and advised household arts or arithmetic instead of Spanish. Even the fact that she made a passing grade in Spanish, does not convince me that she is capable of learning enough of this language to make its study profitable. She received grades of 78 in Spanish and English. Her grades of 85 in both algebra and history indicate either that she found them interesting or that she had an easy teacher. In VIII-A her best grade was 85 (in arithmetic).

*Number 28* (C.A., 15-10; M.A., 13-6; I.Q., 85) is pretty and very pleasant, but found VIII-A hard. The fact that she only made three credits in high school justifies the reluctance of her VIII-A teacher to promote her. Her I.Q. of 85.5 predicts for her a limited term in high school with increasing difficulty. She hopes to do office work for her living. I advised her to take English, bookkeeping, general science, and arithmetic. Her grades were: English, 77; bookkeeping, 80; general science, 78. She was absent from her arithmetic examination.

*Number 29* (C.A., 15-2; M.A., 11-5; I.Q., 75) was most interesting. She was extremely nervous, very slow to comprehend work, and repeated VIII-A. In high school she was enthusiastic about athletics, developed leadership in gymnasium work and games, and held a class office. She took the courses advised and made 76 in English, 86 in household arts, 78 in general science, and 89 in chorus.

*Number 30* (C.A., 16-9; M.A., 11-11; I.Q., 74) is neurotic. She did not do her VIII-A work well enough to win a regular promotion. Her rather unfavorable home conditions, as well as her age, made it seem advisable to send her to high school for industrial work. I advised English, printing, general science, and chorus. She remained in school one year, and then entered a hospital to take nurses' training. She has passed her probation period successfully. With an I.Q. of 74 she seems dangerous there. She did well in printing and enjoyed it. She passed in general science and English and played first violin in the orchestra.

# TEACHING AND FOLLOWING-UP SUPERNORMAL CHILDREN IN A SMALL PUBLIC SCHOOL

JULIA F. KEANEY
*Public School Number 11, New York*

The Terman Class of Public School Number 11, was composed of twenty-seven boys from nine to twelve and one-half years of age, with I.Q.'s ranging from 109 to 146. They were grouped in sections from V-A through VI-B, but none of the groups was large. To determine which children were fit candidates for such a class we gave group tests, supplemented by individual tests. The results of the latter were in each case compared with the teacher's estimate of the child's ability and the former ratings on his permanent record card. When a striking difference was noticed, the boy was given a chance to prove his I.Q. We, therefore, admitted to the Terman Class boys with I.Q.'s as low as 109. Only one of them fell short of our expectations while others accomplished the same results as those in the higher range.

Since this class was an innovation, it acted as a wonderful incentive to all the boys in the school as well as to those who became members of the Terman Class. There is always a fear that such segregation will bring about harmful results to the individual. But, I can truthfully say after three terms' experience with these boys that no ill effects were noticed. I felt, however, that eventually these boys would have to mix with the others again. For that reason and to prevent the development of a feeling of superiority, I did my utmost to make them realize that the only difference between their class and the rest of the school was that in the Terman Class we expected more intensive work and better results. I therefore set a high achievement standard for each group. I did not rely entirely upon the Intelligence Quotient when forming my estimate of each boy. I found among these boys only one real disciplinary case. After a close study of him for a week or more, I discovered that he had superior executive qualities as well as ability. The only trouble was that he had been kept marking time with boys of much lower mentality. I therefore worked his qualities as a

leader and student to the very utmost and, in a short time, he ceased to be a "case."

From the beginning I found myself confronted with a set of boys, eager for knowledge and with a determination to get it. My aim in teaching this class was to enrich their curriculum rather than to speed up the work and drive the boys on from grade to grade. Many good books were put at their disposal so that they could do intensive work under supervision. Every one of them was an inveterate reader. This common characteristic was most helpful in handling the various groups. In many instances pupils acted as teaching assistants in connection with lower groups or on subjects in which they were especially strong.

Easy access to a set of the "Book of Knowledge" and membership in a nearby public library were two additional means of gathering information. I realized very soon however, that if I permitted these boys to go ahead gathering book learning without a proper foundation for it, I should be developing a set of precocious children who would be lost in the crowd eventually. I wanted to help them to become leaders in the future. I therefore made sure, in the first place, that the essentials of every topic were mastered before more extensive work was attempted. Moreover, besides utilizing and developing any latent teaching and executive ability, I organized what were known as drill masters. The work of these masters was just what the name implies. Any boy showing a weakness in a subject became a drill master in that particular line until he could prove that he no longer needed review himself. The effect of this method was twofold because by it I strengthened weak spots and cultivated the powers of leadership. The drill master was often the originator of a new scheme of review.

It might seem as if the enriching of the curriculum were accomplished mainly by books. But another and still more interesting method was that of making weekly visits to places which afforded information on topics pertaining to the work of the grades represented in the class. It was often necessary to obtain permission to visit these places; and accordingly, the writing of

an appropriate business letter sometimes became the subject matter of a composition lesson. If the place of interest was near enough, a committee of two (chosen by regular election) was delegated to secure permission. In this way, I found that I could encourage a business-like attitude in the boys and help them to realize that we were training them in school to do exactly what would be expected of them in the outside world. Every trip was preceded by a discussion of the topic with which it dealt and was reported in the composition and oral English class. Each child carried a notebook with him on these visits. In it he jotted all the information he could obtain. Thus, a visit on board the Aquitania, which was made in connection with geography, gave us material to use in every subject of the curriculum. Some of the other excursions included trips to Ellis Island, the Custom House, the Goody Shop Factory, the Historical Society of New York, the Aquarium, Battery Park, the Museum of Art and Natural History, and a Glass Factory. Whenever possible I linked the classroom work with the activities of the business world.

The physical condition of these boys was regarded as an important consideration. Because, after all, of what use are brilliant minds in frail bodies? These boys, although mentally superior to the others, were not physically the pick of the school. Therefore, the main object of these excursions was not only to enlarge their knowledge but also to get them out into the open air. I planned all my trips so that we either took a long ride or had a chance to play in a nearby park at noon. These visits had an added advantage, for they afforded the boys a chance to study their own city. We never returned over the same route that we took going out. It was by taking them out that I learned that they had not lost anything socially by being grouped together with a reputation for brilliancy. They made friends easily wherever they went and always succeeded in gaining admission where a sign read "Positively no admittance except on business." People seemed to be particularly interested in them. And it must be remembered that it is not always convenient to have 27 active-minded youngsters around.

The government of the Terman Class was purely self-government, very much on the order of the school city that has recently been organized in Public School Number 11. So as not to lose any of the social side of school life while attempting this intensive work. We organized several clubs: the 3 C's Club (Checker, Chess), a Poet's Corner, an Art League, and a Question Box. The last was in reality a book, always at the boy's disposal, in which he could enter any question of school or outside interest on which he wanted open discussion. Once a week these questions were discussed by the class. In the meantime every boy was expected to find out as much as possible about the matters involved. The Question Box afforded an interesting way of cultivating powers of oral English without doing so through actual lessons. This was always a most animated period.

Most of these boys went on to the seventh grade with me and here, again, I found that they had not lost the proper attitude toward the rest of the school. The majority of them are now in the lower half of the eighth grade. Their present teacher's opinion of them will bear out my previous statements concerning their attitude. He says, "They are thirsty for knowledge and have a well-developed sense of how to get it. They are very well informed. Wide-awake but physically not so fit as the others, yet they try in the athletics." They are all holding AA records with the exception of three. At present five of them are in the upper-eighth grade; and it is expected that they will be graduated with the class, although they are below the average age. I continue to keep in touch with these boys and their teachers because I am most anxious to follow up their special achievements.

None of the Terman boys has yet entered high school so I cannot say what the result of this intensive training has been except from the elementary-school standpoint. We could not continue this class in Public School Number 11 because of the small number of pupils registered and because we did not have enough of the higher I.Q. type to draw from when necessary. We found it difficult to replace withdrawals and so we were practically compelled to let the class die out.

# Editorials

## RESEARCH AMONG LONDON TEACHERS

We have lately been greatly interested in reading a series of publications issued by a group of teachers in London, England. As a supplement to the periodical called *The Head Teachers' Review* a pamphlet appears three times a year under the title of *Educational Research*. Thus far, the material contained in *Educational Research* has dealt largely with intelligence scales. The Binet scale, the Terman group test, and a selection of test materials made by a committee of this particular group of teachers—these and the discussion of them—play an important part in this periodical. Some of the material seems trite to American readers. This is not said in a spirit of criticism, far less of condescension. Our English friends are prompt to give credit to the American psychologists and educators for pioneering in these fields.

But although some of the writing contained in *Educational Research* is not new to American readers, there are nevertheless some things which, so far as we know, have not been better presented anywhere. And, although intelligence testing is of special interest to the group under whose auspices this periodical is issued, there are several notable exceptions. For example, Doctor Rusk, whom many of us know as the author of the book, "Experimental Education," writes an interesting article on "Suggestions toward an Analytical Scale in English Composition." In another issue are presented data which tend strongly to indicate that so far as rote memory work is concerned, the late afternoon is as good a time for learning as any other period of the school day. Again, there is a fine report of an investigation concerning the opposites tests. One may remark, in passing, that an extraordinary result was revealed when the scores of two

of the opposites test were compared with the term examination results. In the case of an upper class of backward girls, the corrected correlation was 0.93, and the writer of the report remarks, "The children of this class could, therefore, through these two tests have been graded with approximately the same degree of accuracy as through the school examination." In the same number an interesting report is presented of an experiment designed to show the effects of a holiday on school knowledge. The tests used were not standardized, and identical forms were used before and after the vacation period. There was a loss of about fifteen percent in the arithmetic scores, practically no loss in spelling, and a small gain in history. In the next issue a more extensive experiment on the same topic was reported. There was practically no loss in reading, a twenty-five percent loss in arithmetic, and a twenty-eight percent loss in spelling.

What interests us most in this publication is that it is supported by *teachers* rather than by supervisors or administrators. Moreover, it was the teachers who made the investigations. The attitude of these teachers is well expressed by Mr. T. G. Tibbey, the editor of the periodical. He is speaking particularly of intelligence testing, and American teachers would do well to consider the attitude he suggests. "We teachers," he says, "need to follow hard on the heels of the administrators. . . . It is better indeed if we can get a little in front of them. And if we wish to guide them in their use of intelligence tests—they need guidance—and see that the inferences made are not greater than the results justify—they are sometimes—we also must try over these tests for ourselves, to find what they have to teach us and what modifications are necessary to adapt them to the special needs of our pupils."

B. R. B.

## RESEARCH *DE NOVO*

Suppose you could begin all over again. Suppose you were set back to 1910 with all the knowledge and experience you now have with respect to tests and methods of research. You have made, let us suppose, many mistakes in the past ten or twelve

years. You have tried first one thing and then another. You have argued with reactionaries and puzzled over statistical tabulations and conducted teachers' meetings and written reports. You have followed some trails that merely led deeper into the woods, and if you had sense enough, you have retraced your steps to the fork of the road. Other paths have led more directly to a desirable educational objective. With many a trial and error and with considerable lost motion you have arrived at a certain competence in the application of measurement to education. It is 1923. If you have kept abreast of developments—it is no easy matter, to be sure—you are up on the latest diagnostic methods, such, for example, as the brilliant analyses in reading recently made by the Chicago school; you are wise about achievement and pedagogical quotients; in short, you have a certain equipment which is remarkably different and much more resourceful than was the equipment of equally capable educators in 1910.

Now, suppose that you are able to play the Yankee in King Arthur's court and to transplant yourself to a situation corresponding to that which prevailed in this country a little more than a decade ago. We hasten to say that we are under no delusion as to the change in practice which has come over the school situation in the past ten years. We know, for example, that the critical insight displayed in the matter of reading abilities and reading materials by Gray (both W. S. and C. T.), Buswell, Judd, Jordan, Dunn, Yule, Stone, Horn—we know that this insight has not yet manifested itself in practice except in a very limited way. But these doctrines have been set forth. They are, or may be, our common possession; and they are as far-reaching and significant in 1923 as they would have been impossible in 1910. In possession of them we are supposing that you are transported to a situation where with all this equipment you may in addition be untrammeled by precedent and unhindered by obstructionists.

The idea is rather attractive, is it not? Perhaps it seems merely an idle dream. It is, however, the idea which passed through our mind when we lately read of the situation in which

Doctor McCall has been placed in China. As one of the representatives of the National Association for the Advancement of Education in that country, it is his duty to install in the government and missionary schools the new scientific technique as it has been developed in America. Unquestionably, Doctor McCall has been selected because he is one of the leaders in the field of scientific education. He goes into a country where the educational leadership is of a different sort. It is true that a number of the Chinese and some of the English-speaking workers in the missionary schools know something about the measurement movement; but these men are apparently aligning themselves with Doctor McCall as supporters of his undertaking.

Essentially, therefore, it seems to us that McCall is like the Yankee who found himself a knight of the Round Table with all the nineteenth century inventions at his disposal. Among the events of the day in educational research we know of none whose dramatic possibilities equal that which is transpiring in the orient under the leadership of McCall. In that land of tradition and age-long civilization it is as much a modern anachronism as a broadcasting station in the palace of Tiglath-pileser. And for McCall it is a chance to profit by his experience and the experience of others. It is a chance to avoid old mistakes and to take the most direct road to success. It is like starting to live all over again with the experience of having lived once as a guide. It is educational research *de novo*.

While you cannot make as sharp a break in your career as the interesting machinist of Hartford, Connecticut, or his *fin-de-siècle* counterpart from Teachers College, you, too, may find yourself in a position to carry your experience into new situations. There you may be relatively free from the confining influences of the particular way of doing things into which you may have fallen. You may even, for the good of everybody concerned, stage a mild revolution where you now are. Change for the sake of change is puerile; but the failure to get out of a rut when the reasons for doing so are daily multiplying is senile. A robust maturity will see many a way in which new plans may be made and executed.

B. R. B.

# Reviews and Abstracts

EATON, THEODORE H. *Rural school survey of New York State. Vocational Education.* Philadelphia: William E. Fell Company, 1922. 293 pp.

Apparently the only varieties of vocational education offered to the youth of rural New York are those related to farming for boys, and home making for girls. Training courses in the mechanical trades and industrial arts are non-existent and mention in the Survey only as remote and impractical possibilities.

The volume is mainly devoted to a report on studies of classroom conditions and practices, teacher qualifications, pupil interests and reactions in the state-aided agriculture and home-making courses of rural high schools. The results of these studies are presented in some two hundred tables of frequencies, percents, and summaries. Such material may interest students of educations, but it is out of place in a survey presumably intended for parents, citizens, and committees of laymen.

The constructive value of the survey would be greatly enhanced by a comprehensive discussion of the whole field of rural vocational education. There is also noticeable lack of reference to similar work in other states.

Some significant statements to be gleaned from the survey are:

1. There are at the present time 72 high schools and 4 intermediate schools offering agricultural courses aided by state and federal funds. Thirty-eight of the schools offering agriculture have courses in home making similarly aided. There are also 13 high schools having only courses in home making and 4 intermediate schools of home making. The state also supports 6 agricultural schools offering post-secondary work.
2. Seventy-eight percent of the boys enrolled in agriculture are the sons of farmers. From 3 to 6 times as many graduates of agricultural courses enter farming as from rural high schools in general. Not more than one boy in 8 or 10 of the boy students in agriculture is reached by the present vocational agricultural organization.
3. The aims of instruction in agricultural schools are not clear. The tendency, however, is to make them distinctly vocational.
4. Many agricultural schools are failing because principals and superintendents have been academically trained and are more in sympathy with education as a discipline than as a direct development along specific lines.
5. Supervision of home projects is not adequate in plan or execution.
6. Courses in home making give too much attention to cooking and sewing and neglect the controlling and enriching knowledge that homes cannot furnish.
7. Lack of practical experience is a common deficiency in teachers of both agriculture and home making.

The following recommendations are made by the author:

(1) A better system of records in the State Department to show qualifications of teachers, pupils, courses followed etc.; (2) more use of demon-

stration method in teaching skills; (3) more attention to social and commercial phases such as,—organization for cooperative buying and selling; (4) higher standards of technical requirement for teachers and the assignment of men to positions where their major skills and abilities will be most useful; (5) better equipment for agriculture and home-making laboratories and classrooms; (6) more emphasis on important sources of agricultural wealth; (7) re-arrangement of courses so that a student can take at once subjects in which he is interested rather than be obliged to await their appearance in the third or fourth year; (8) need for rural pre-vocational courses and vocational guidance; (9) better publicity to reach a greater number of adolescent boys and girls and secure their enrollment in the vocational courses offered; and (10) larger unit of school taxation and administration to distribute the financial burden between village and outlying districts.

W. S. DAKIN

*State Board of Education, Hartford, Connecticut*

BUSWELL, GUY THOMAS. *Fundamental reading habits: a study of their development.* (Supplementary Educational Monographs No. 21.) Chicago: University of Chicago. 1922, 150 pp.

The problem of this monograph is the development of certain phases of the reading habit from beginning to maturity. The method consists in recording eye-movements by means of photography. By this method records were made from the reading of 186 subjects, of whom 173 were in elementary or high school and 13 in college.

The treatise opens with a clear cut discussion of the differences between mature and immature reading habits. This comparison is made in terms of eye-movements. The teacher's purpose is to change the immature to the mature form of reading.

Chapter II presents curves showing the development through the successive school grades of three different phases of the reading habit. These are the number of eye-movement pauses per line, the length of these pauses, and the percent of regressive movements. For silent reading these curves have the same direction to the fourth grade. At this point the curve for the number of pauses enters a plateau which continues until the first year of high school. At the sixth grade the curve for the length of the pauses enters a plateau which continues through the college group, while the curve for the percent of recessive movements continues to rise to the end, except for a drop at the sixth grade. Similar data are presented for oral reading.

Correlations between the three types of data upon eye-movements and scores for the Gray oral reading test and the Monroe silent reading test are presented. These correlations are set forth in the form of graphs rather than coefficients. It is clear that the different elements of eye-movements are important phases of the types of reading measured by these tests. It is to be noted that these correlations are based upon the average number of pauses per line, the average length of pauses and the average number of regressive movements. It would be very interesting to see the same correlation in terms of the original data rather than the averages.

Chapter III is given over to a careful comparison of two methods of teaching primary reading. One of the methods emphasizes word mastery while the other begins by developing the correct attitude toward reading and later emphasizes the technique of word study. Eye-movement records are presented which show that the two methods result in very different modes of reading on the part of the children. The author emphasizes that each method may produce efficient readers, but the curve of development for the two groups will be very different.

This chapter also presents data upon the rate of oral reading in the primary grades. This is done by means of phonograph records. These are so made that each word as it is pronounced is recorded in a time sequence. This method shows clearly that pupils who have the same *rate* of reading may have different methods of reading—especially as to the grouping of words. This device is probably the only one for dealing with rate of oral reading in a more detailed way than is permitted by the standardized reading tests.

The last chapter deals with certain individual cases. It shows how children may vary from the normal route as they progress toward mature reading. It indicates that remedial teaching is often a means of restoring their development to its normal course.

The entire monograph is thorough-going and shows evidence of most careful and painstaking work. If, however, one looks through the book with the distinct notion of making criticisms, two points suggest themselves. First, for the scientific student some of the details of the technique are not clear, and second, it seems that some of the results could have been more closely related to those phases of reading upon which eye-movements depend.

It is a monograph which all scientific students of education, as well as those teachers of reading who have had scientific training, will read with interest.

C. T. Gray

*School of Education, University of Texas*

Mitchel, Wesley C., and others. *Income in the United States.* New York: Harcourt, Brace and Company, 1922. 152 pp.

"The National Bureau of Economic Research, Incorporated, was chartered in 1920 to conduct quantitative investigations into subjects that affect public welfare." Its first report "Income in the United States" indicates the nature of its task and the importance of its effort to lift discussion of certain fundamental economic questions from subjective opinion to objective knowledge.

This volume is a summary of the entire report. The second volume shows in detail the sources from which the data was drawn, the methods used, and the margins of doubt.

The investigation attempted to answer these questions: What is the aggregate income of the American people? How much does that income vary from year to year? What part of the changes is due to fluctuations in prices and what part to fluctuations in the productions of goods? How is the aggregate income divided among individuals? What proportion of the whole income

goes to wage earners and salaried employees? How does the per capita income in the United States compare with that in other countries?

The report covers a ten-year period 1909-1919. Two independent estimates were made for each year: one based on "sources of production," the other on "incomes received." When the two parallel investigations were finished, the maximum discrepancy for any one year was less than seven per-cent—a fair measure of the accuracy of the work.

The two basic chapters, "Size of National Income" and "Distribution of National Income" give a most interesting array of facts and descriptions of the authors' method of treating the data obtained. The layman who reads the "Conclusions" will refer again and again to the two basic chapters.

The conclusions state tersely certain fundamental facts concerning our national income. When the effect of the rise of prices was eliminated, the annual per capita income in the United States showed a steady increase from $333 in 1909 to $400 in 1916 and then a decrease to $372 in 1919. Our participation in the war tended "to diminish somewhat (at least temporarily) the inequality in the distribution of American incomes"; and yet in 1918 five percent of those gainfully employed received about 25 percent of the nation's total income. For the year 1918 the number of income recipients was nearly 40 millions and the total income was more than 60 billions of dollars. Excluding soldiers and their incomes from the figures, the mean income was $1,543, the median $1,140, and the mode $957. Only *one* percent of income recipients for 1918 had annual incomes exceeding $8,000, only five percent exceeded $3,200, only ten percent exceeded $2,300, and eighty percent received less than $1,800.

Such facts as the foregoing are bound to affect public thinking on economic questions; they help to clarify issues that demand readjustment. Everyone interested in the economic condition of this country will want to read, "Income in the United States—Its Amount and Distribution."

J. CAYCE MORRISON

*State Education Department, Albany, New York*

DADISMAN, SAMUEL H. *Methods of teaching vocational agriculture in secondary schools.* Boston: The Gorham Press, 1921. 142 pp.

The available and helpful material on the teaching of vocational agriculture from the point of view of the one interested in teacher training is limited. The author has put in the book the outlines he uses and the experiences he has had in his work as supervisor of teacher-training classes in the University of California. It should be very helpful to persons engaged in training teachers of vocational agriculture. He discusses (1) the historical development and importance of vocational agriculture as provided for under the Smith-Hughes act, (2) planning lessons and lesson plans, (3) outlines of a four-year course in vocational agriculture, (4) the farm mechanic course, and (5) rural organization. The book lacks cohesive organization, but contains helpful material for teacher-training departments in agricultural colleges.

EDWIN L. HOLTON

*Kansas State Agricultural College, Manhattan*

BINGHAM, HAROLD C. *Mechanical aids for the classification of American investigators, with illustrations in the field of psychology.* Washington: National Research Council, 1922. 50 pp.

I wonder if research workers in education are appreciating the facilities which may be placed at their disposal by the National Research Council? This pamphlet by Dr. Bingham will bring the matter concretely to their attention. The Research Information Service, which is maintained by the Council, has secured about 14,000 personnel records of men of science. These records have been divided into fifteen groups, of which education is one and psychology another.

The problem then was how to classify and handle these personnel records so that they would yield as many different types of information as possible. The reader may imagine himself in possession of several thousand record sheets made out by individuals, each recording the position the individual is holding, his date of appointment thereto, previous positions, nationality, training (several sub-topics), membership in societies, distinctions or honors, fields of research, investigations in progress, publications, etc. It is clear that as long as one wished merely to know full details *about a given individual* it would be sufficient to file these sheets in alphabetical order. This, however, would be a very limited use of the material. One would surely want, in the first place, to group the sheets according to the major fields of human knowledge to which they were related. This could still be done by certain arrangements of the original sheets; but as soon as one wished to assemble, say for the psychologists, those who were engaged in investigating a particular type of problem such as mental tests or those who were engaged in work for penal institutions or those who possessed Ph.D. degrees—as soon as one desired such types of information—it is clear that an alphabetical arrangement and grouping of the original sheets would be entirely inadequate.

Accordingly, the Research Information Service of the Council experimented with various ways of organizing the data. First, visible indexes and tab systems were tried. It was soon found, however, that these devices would provide little, if any, advantage over the file of original records in making this personnel information available.

The Hollerith and Powers systems were then carefully considered. These are systems in which the original data, coded by means of numbers, are transferred to prepared cards by a punching system. Doctor Bingham, in his monograph, gives a clear statement of the advantages and limitations of these systems. He found, however, that their limitations for this particular work made them of doubtful value.

An extensive trial of the Findex system, however, seemed to be justified. Students of record systems would do well to read this report if for no other reason than to obtain a clear idea of the Findex system and of the particular classes of data to which it lends itself.

The remainder of the monograph deals with the experiment which was carried out in connection with the records of the psychology group by the use of the Findex system. I do not intend to describe the different ways in which the material is presented to illustrate the use of this particular mechanical

aid (namely the Findex system) in producing records with single or multiple classification.

Two things, however, I wish to point out. The first is that the Research Information Service of the National Research Council has developed a method for locating available knowledge on a larger scale than has hitherto been accessible in the fields of science. The second is that personnel records may be used to an astonishing degree as keys to sources of knowledge.

In conclusion, it should be stated that the personnel files of the Research Information Service constitute only a part of the records at the disposal of the Service. It has wide and varied contacts with investigators, laboratories, and research interests. Those who are engaged in educational research will do well to get in touch with the Service and to utilize its resources.

B. R. BUCKINGHAM

*Ohio State University*

UPDEGRAFF, HARLAN. *Rural school survey of New York State.* Ithaca, New York: 1922, 233 pp.

This is the volume on Financial Support of the New York Rural Schools Survey. To state its contents succinctly, it describes and criticizes the generally antiquated, unscientific, uneconomical, and undemocratic system of local support of district schools existent in that state; but this is not all—it suggests a remedy for these untoward conditions.

The book is the most scathing indictment of the district system of school support and control in print. And be it noted that all conclusions in the volume are based on the facts. Indeed, the factual nature of the book everywhere wholesomely stands out; it has, for example, eighty-four tables, all of which are germane to the topic. In objectivity, it takes rank with the best doctor's dissertation.

The remedy proposed for this archaic system of district support and control is, in general, twofold, viz: (1) that the administrative unit be enlarged; and (2) that a system of general and special aid, based on sound economic and educational principles, be organized by the state. A proposed scheme for granting this state aid is thoroughly and objectively worked out and this is probably the outstanding contribution of the study.

In brief, the study exhibits just the sort of financial inquiry that needs to be immediately undertaken in every state of the Union, for unquestionably, the financial problem is the most urgent and vexing problem facing education today. We have been temporizing and tinkering with it all too long; it needs to be studied everywhere in a thorough-going manner. Let more of our administrative experts join with Professors Updegraff and Swift in studying this problem, for its solution will challenge many educational Solomons.

One wishes, however, that some of these excellent survey reports might be written so that they would be intelligible and appealing to the layman and typical teacher. Practically all of them are written so that only the educational expert can make his way through them. Let us have more survey reports that can be read by the great majority of our citizenry, even though the realization of this may necessitate the omission of such cherished statistical

term as medians, quartiles, mean deviations, and methods of rank differences. By so doing, we shall perhaps be able to reach a very large, and withal a very influential, reading clientele, which is interested always in schools and means of improving them.

WARD G. REEDER

*Ohio State University*

RUSSELL, CHARLES. *The improvement of the city elementary school teacher in service.* (Teachers College, Columbia University Contributions to Education, No. 128.) New York: Teachers College, Columbia University, 1922. 139 pp.

It takes two and one half hours to read Dr. Russell's thesis. The time is well-spent for either the school executive or the student of education. The first section of this book gives a well-proportioned survey of the historical background of teacher improvement.

The second section analyses a sampling of school reports in order to present in organized fashion the character of agencies of teacher improvement now in vogue. The present agencies are listed under the captions (1) extension activities, (2) teachers' meetings, (3) devices, (4) professional supervision, and (5) work with new teachers. The bibliography reports on 91 school systems at least once. Sixty-five percent of these systems are in far eastern states. To the extent that Dr. Russell's survey is a critical one, Massachusetts is the leader in teacher improvement. Sixteen Massachusetts school systems furnish material for the report. The value of the survey would have been increased by better sampling. For example, many cities like Springfield, Mass.; Des Moines, Iowa; Los Angeles, Calif. have teacher improvement schemes worthy of mention. There is also no effort to push the survey beyond the reports found in published documents. No attempt critically to appraise the worth of the schemes *in practice* is reported.

The third section deals with the fundamentals of improvement. Improvement comes in three ways, through better knowledge of the subject matter, through better mastery of technique, and by more vigor, drive, or idealism on the part of each individual teacher. This section is characterized by clean cut analysis.

Dr. Russell, however, under-estimates the possibilities now present in the matter of technique. How any unit of the content of a curriculum is to be taught is not, as he suggests, the "clear province" of the individual teacher. For many units there are better ways which teachers should be led to use. Interwoven with a discussion of types of improvement, the author discusses how to provide the *motive* for improvement. The motive centers around matters of salary. There are matters of adjustment which effect teaching efficiency and its improvement which are missed in this study, for instance, the social life of the teacher, housing, etc. Perhaps we are not ready officially to consider a vital problem revealed by psycho-analysis. Many teachers fail in subtle ways, for they do not learn how to be successful spinsters. How to improve teaching by the breaking up of frequent worry and anxiety complexes is a problem for the future to solve but it is time to begin to recognize it.

Schemes of improvement to be complete must recognize that the teacher as a person lives seven days a week and twenty-four hours a day. Maladjustments in any phase of personal living affect every other phase of life.

The last section of the book sets up in outline the steps through which a teacher must pass from raw novice to mature master. The reviewer knows of no outline around which to group the minutiae of teacher improvement as sane and sound as the outline here. Orderly progress is from novice to journeyman, to graduate teacher, to master. Doctor Russell contends with much wisdom that the first few years of actual teaching should be done in a school managed by other beginning teachers and guided by several master teachers.

The book is a real contribution in the field of the personnel management of the teaching staff. It will be read by forward-looking superintendents. It will also serve as a text in certain phases of fundamental courses in school administration.

F. B. KNIGHT

*State University of Iowa*

LEONARD, STERLING ANDRUS. *Essential principles of teaching reading and literature.* Philadelphia: J. B. Lippincott Company, 1922. 460 pp.

"Our best procedure is not to aim direct at 'getting children to love the classic literature,' as we have sometimes been exhorted to do. It is rather to provide a purpose sufficient to secure their understanding, their realization of such literature; for without such realization, nothing worthy of being called appreciation can possibly exist; with it, appreciation of whatever is related to the individual child's experience will be inevitable."

This passage is, perhaps, the golden text of Professor Leonard's thoroughly stimulating and valuable new book on "The Essential Principles of Teaching Reading and Literature." To help the child to an appreciation of literature, he maintains, we must first study and know more of the youngster's actual tastes and comprehension. What these are and how we may select literature adapted to these interests, needs, and powers, form the thesis of two well presented chapters. These are followed by discussions of the technique of teaching reading, both oral and silent, by an analysis and an evaluation of the ways and means of "determining by objective measurements individual children's exact ability in understanding what they have read," and by some excellent suggestions for stimulating genuine and cooperative help in the realization of this new experience. Of special interest is the carefully presented account of the author's own work in the Wisconsin High School in the use of amateur dramatics as a means of increasing the pupils' ability to interpret and vitalize the contents of the printed page.

To teachers of reading and literature who are still pursuing the methods of instruction in vogue a decade or two ago, the book will come as a revelation of the fact that these methods are about as antiquated as a 1912 Ford. Mr. Leonard has here included a bibliography of about one hundred pages which is as well chosen and valuable as it is complete. The author's wide range of interest in all phases of his subject and his knowledge of these are well

reflected in the references and footnotes which fleck his pages, and from which alone might easily be constructed an excellent course of reading and study.

Teachers of reading and of literature have every reason to be grateful to Professor Leonard for this most admirable book. For them to read it will be a delight and a privilege; to be ignorant of it will be a misfortune and almost a scholastic disgrace.

H. G. PAUL

*The University of Illinois*

NORDGAARD, MARTIN A. *A historical survey of algebraic methods of approximating the roots of numerical higher equations up to the year 1819.* (Teachers College, Columbia University, Contributions to Education, No. 123.) New York: Teachers College, Contributions to Education, 1922. 64 pp.

The writer has undertaken to trace the history of various methods of approximating roots of algebraic equations in one unknown in use up to the publication of Horner's "Method" in 1819, and their development into general methods for solving complete equations of any degree.

The earliest mention of the solution of equations is the reference to three quadratic equations studied by the Egyptians about 2000 B. C. The Greeks approached the solution of problems involving roots by way of geometrical constructions. The superior notation and symbolism of the Hindus enabled them to use processes of inversion—leading to our "evolution"—that later were adopted by the Arabs. The Arabs vitalized and enriched the content of algebra by applying algebraic operations to the problems of Greek geometry, astronomy, and trigonometry. They passed on their methods to Christian Europe through the writings of Leonardo of Pisa, about 1200 A.D.

The first successful general method of solving complete numerical equations by approximation was given in France by Chuquet, in a manuscript dated 1484, but not printed until 1880. This method remained comparatively little known. Extensions of Leonardo's method of finding cube roots to the solution of equations of higher degree were the ones most generally used before the year 1600. This year begins a new epoch in the history of the solution of numerical equations by the first publication of Vieta's comprehension method of solving complete equations.

During the seventeenth century, the symbolic notation introduced by Vieta was improved by Harriot and Descartes. The law of signs, refined by Newton, the invention of coordinate geometry by Descartes, and of the calculus by Newton and Leibnitz gave powerful impetus to practical numerical calculation. Infinite series gained an effectiveness undreamed of by the ancients, with the introduction of symbolic algebra.

At the beginning of the nineteenth century Newton's method of approximating roots held undisputed sway. Its only rival was the method known to the western world by Horner in 1819. It is interesting to note that this method was known and used in China, Japan, and Italy before 1819. Upon its publication it became widely used in England and later in the United

States. It was used to a less degree in Germany, Austria, and Italy, but was never adopted in France.

The teacher of mathematics in the high school must know his subject thoroughly and must keep his knowledge alive by reading and study. This book is certain to find a place in the list of books that can be recommended, along with the professional journals, for reading by all high-school teachers of mathematics. More scientific studies of this type, of somewhat limited fields in mathematics, should be made available—on condition that they are written as interestingly and provided with illustrative solutions and chapter summaries as is the volume before us.

J. A. FOBERG

*State Department of Public Instruction*
*Harrisburg, Pennsylvania*

WEBER, JOSEPH J. *Comparative effectiveness of some visual aids in seventh-grade instruction.* Chicago: Educational Screen, Inc., 1922. 131 pp.

This monograph reports a series of experiments comparing methods of visual instruction with oral presentation. The experiments were carried out adequately and the results are presented in careful and accurate form. The monograph as a whole constitutes the most careful and comprehensive report of a study in visual education which has thus far been published.

A preliminary study by means of questionnaire was made to determine the primary sense experiences which form the basis of the recognition of fifty words selected at random. Eighty-one psychologists and experienced educators were asked to indicate with reference to each word, the sense or senses through which its meaning originally came. The averages indicate that the various senses are represented by approximately the following percents: visual, 40; auditory, 25; tactile, 17; miscellaneous organic, 15; taste and smell, 3. While this method is only a very rough way of determining the origins of the meaning of words, it is at least far superior to the extravagant estimates formerly made.

The first real experiment consisted of a comparison of the effectiveness of a motion picture film shown to a group of children with the effectiveness of an oral presentation of the subject matter of the film. The film was a travelogue and was therefore largely descriptive in character. The oral presentation followed the scenes of the film in detail. As the author admits, this oral presentation was for the most part formal and uninteresting.

The tests consisted of a yes-and-no examination. The film presentation proved to be superior to the oral presentation. The initial knowledge of a parallel group of children was measured by a score of 31.75. The oral group made a score of 45.48. A second group which had an oral presentation followed by the film made a score of 49.86, and a third group to which the film was first shown and then the oral presentation given made a score of 52.69. Considering the nature of the subject, one might have expected an even greater difference than this in favor of the film.

In order to determine the comparative interest which was awakened by the film and the oral lesson, the children were asked to choose whether they

would prefer to travel to countries seen in the film or to Palestine. It was found that the film group exhibited a preference for the country seen in the film which exceeded that of the oral group by 3 percent.

The second experiment was devised to determine how well children could draw an imaginary animal when they were shown the picture, or when they were given a verbal description. The superiority of the picture to the description was represented by 53 percent as compared with 40 percent. Such a result might have been expected.

In another experiment four methods of presentation were used in the case of each of four subjects. The first method consisted in showing the film; the second in showing the film with accompanying remarks; the third in study of a printed description; and the fourth in an oral presentation. The subject of the films was geographical. The differences in the results of the various methods of presentation in this experiment were much less than in the other experiments. The film and the film-lecture methods give approximately the same results as the method of oral presentation when measured by the ability to give information verbally. Measured by the ability to draw, the visual method is distinctly superior.

The interest which was awakened by the films in comparison to the other presentations was measured in the same way as in the case of the travelogue. The gain of the film over the other methods in this case amounts to two percent.

The reader may draw his own conclusions from the results of this experiment. It is safe to say that for certain purposes visual presentation shows itself to be advantageous. On the other hand, the extravagant claims which are sometimes made for the superiority of visual methods are entirely negatived by these results. We may defer further interpretations until the results of additional experiments are available.

FRANK N. FREEMAN

*University of Chicago*

ASHBAUGH, ERNEST J. *The Iowa spelling scales. Their derivation, uses, and limitations.* Bloomington, Illinois: Public School Publishing Company, 1922. 144 pp.

The Iowa Spelling Scales are the most elaborate attempt that has been made to standardize the spelling difficulty of words. Two thousand nine hundred and seventy-seven words, taken from the Anderson investigation of the "Written Correspondence of Iowa People," were placed in the scale.

While using in the main the same principles of scaling that were employed in the construction of the Ayres Scale, Dr. Ashbaugh has made two notable improvements. One is in listing words below 50 percent difficulty, and the other is in showing accurately for each grade the difficulty of each word. While Dr. Ashbaugh avoids errors incident to smoothing out difficulties of words, by constructing a separate scale for each grade, he sacrifices the means of interpreting in terms of grade achievement the amount by which a given score is above or below the standard. That is, when a class scores 80 on Step 10 of grade III, how much better than third-grade work is the given

class doing? It seems that some table of equivalent scores, intelligible to the average teacher, might be devised that would aid her in interpreting the variations from the standard.

As Rice long ago pointed out, variations in the procedure of giving and scoring the tests make appreciable differences in the results. The directions given are those used in the original testing. They are mixed with a number of other directions with which the teacher who uses the scales has no concern. A section of explicit directions on how the tests should be given would simplify the work and increase the accuracy of the results. The author, however, has made a distinct advance over the work of Dr. Ayres. His suggestion that the words located near the middle of the scale (those with an accuracy of 35 percent to 65 percent) are probably most reliable for measuring purposes is valuable.

Dr. Ashbaugh is admirably conservative in advancing claims for the scales. However, two suggested uses of the scales seem to need further consideration. The first is their use to measure *growth* in spelling ability. Growth in spelling ability may mean either of two things, growth in ability to spell a particular list of words, or growth in general spelling ability. Another suggestion is that the scales may be used as a minimal spelling list for teaching purposes. Without doubt they provide a valuable list of words. It is, however, based upon but one of a dozen extensive investigations that have been made. It is not likely that one investigation, although it embraces as many as 361,184 words, is sufficient to establish beyond question the second and third thousand words. Furthermore, many teachers will question on theoretical grounds the use of adult correspondence as the *exclusive* source of spelling material. The tendency in modern education is to place primary emphasis upon present needs. Children's compositions would seem to offer the most fruitful *single* source of spelling material, but both children's compositions and adult correspondence will give a more reliable list. Such words as *jobber, wholesale, inducement, ere, heretofore, fabric, received, notary, prior, client, auditor, allotment, thesis, affidavit,* and *remittance,* seem foreign to a child's vocabulary. As a source of material for teaching the scales obviously need checking with other lists.

The greatest contributions of the scales are in giving wider circulation to an important investigation of writing vocabularies, providing facts regarding the difficulty of a considerable number of words for use in grading and teaching, and providing a large list of standardized words which may be used to compare achievements in spelling in different schools. The author has carried on a stupendous investigation, and it should be in the hands of every person who is interested in the construction of a course in spelling, or in educational research. As a word list for spelling it would be a vast improvement over a number of books in use.

W. F. TIDYMAN

*State Normal School for Women, Farmington, Virginia*

EUGENE A. NIFENECKER, Director. *Pupils' progress through the grades.* (Bureau of Reference, Research, and Statistics. Publication No. 19.) New York: Board of Education. 1922. 169 pp.

Since the publication of "Laggards in our Schools" by Leonard P. Ayres in 1909, many investigations have been made and there has been much discussion on the subject of over-ageness, slow progress, and high percent of non-promotion in the public schools. "Pupils' Progress through the Grades" by Eugene A. Nifenecker is not only an additional study on over-ageness and school progress but it is a constructive report on school organization. It represents a prodigious amount of detailed labor in statistical tables and exhibits a careful analysis of the factors influencing school progress and a just estimate of their value. The great objective in the New York City schools as in most other school systems is to secure for each pupil a school progress of one grade for each year's attendance in school. Mr. Nifenecker by a study of the ages of children as they progress through the grade, by the compilation of progress tables, by investigation of the promotions and non-promotions in each grade, shows clearly that the schools are not attaining this objective and that in truth such an objective is not possible of attainment.

It is obvious that the effectiveness of instruction is very largely conditioned by similarity in the capacities of the pupils that constitute a group. Pupils are required by the schools to repeat certain grades in order that they may be placed with pupils of approximately the same pedagogical age. This report shows clearly that the individuals composing these supposedly homogeneous groups have widely varying abilities. Three important facts are set forth:

First, by means of achievement tests in spelling, penmanship, arithmetic, and geography, it was found that in these supposedly pedagogically homogeneous groups variability in these subjects was greater than in chronological age. Second, by means of intelligence tests each of these homogeneous groups was shown to have a range in mental age of five or more years, so that the range in mental ages was equal to or greater than the range in chronological ages. Third, many various remedial measures have been employed in New York to increase the homogeneous character of the groups, such as special classes for foreigners, classes for defective pupils, special classes for over-age pupils, vacation classes, double-time plan, the Batavia plan, rapid advancement classes, etc. In spite of all these efforts the pupils vary greatly in chronological age, in pedagogical and mental ability.

The report pleads for greater flexibility in grading, in course of study, and in methods of advancing pupils and for a more "purposive program." In classifying pupils two great aims must be considered: first, those "pupils who have the same educational status, whose educational achievements are equal, and whose instructional needs are similar" should be brought together into one class; second, those pupils should be brought together who can progress at the same rate.

The most valuable chapter in the book is that entitled "Flexibility versus Uniformity in School Organization and Progress." In this, it is recommended that intelligence tests,—that is I.Q.'s and mental ages, together with accomp-

lishment quotients (A.Q.'s)—form the basis for the grouping of pupils for school work. Under this scheme the following groups are suggested: (a) very dull or backward pupils (mentally defective), (b) dull pupils, (c) average or normal pupils, (d) bright pupils (above average ability), (e) very bright or gifted pupils.

The report recognizes that the adoption of the plan of grouping suggested involves very great modification in present educational procedure but contends that such improved procedure will eliminate the misfit pupil and the misfit course of study since the course of study will be adjusted to the needs of the various groups of pupils and each pupil will be placed in that group with which he can work happily and successfully.

This change demands, of course, that uniform curricula and uniform standards of progress must give way to flexibility and to differentiation. The report shows that age-grade and progress statistics instead of being measures of efficiency of schools and school systems are rather measures of "maladjustment of pupils' abilities, pupil needs, and educational aims and treatment." The flexibility suggested does not mean the lessening of educational opportunities for any child but it does mean the adjustment of the curricula of the school to the abilities and needs of the various groups. It is believed that the plan suggested will result in retaining pupils in school for longer periods and in giving a fuller measure of education to each group of pupils.

The writer in general agrees with the conclusions of the report. He believes that the case for a flexible school organization has been conclusively made. Whether the exact groupings suggested in the report are the ones that should be used in every school system is doubtful. Some systems may handle the work successfully with three or four groups of pupils; others may need five or even six. We note, for example, that it is suggested that dull pupils include those ranging in I.Q. from 70 to 90. Possibly this range is too great. Some systems include only 70 to 80 in the group of dull or borderline pupils. Others include from 70 to 85. It may be that there should be two groups of dull pupils between 70 and 90. It is possible that greater emphasis should be placed upon certain other factors that condition school progress than is indicated in the report. Health and physical development should receive greater consideration, also certain moral and social conditions must be given weight. This last factor leads to the formation of classes for delinquents.

GEORGE MELCHER

*Director of Research and Efficiency, Kansas City*

# News Items and Communications

**This department will contain news items regarding research workers and their activities. It will also serve as a clearing house for more formal communications on similar topics, preferably of not more than five hundred words. These communications will be printed over the signatures of the authors. Address all correspondence concerning this department to Doctor E. J. Ashbaugh, Ohio State University, Columbus, Ohio.**

Query of an anxious reader: "Are any of you fellows going to answer Walter Lippmann's series of articles in *The New Republic*?" Who is Walter Lippmann?

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Under the direction of the Bureau of Educational Measurements of the University of Pennsylvania a study is about to be inaugurated of the Pennsylvania state normal schools. Professors Updegraff and King will be in charge of the project.

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Doctor John L. Stenquist, director of the Bureau of Research of the Baltimore Public Schools, and Superintendent West are planning to issue a periodical bulletin which will be devoted in part to research work. They are also laying plans to issue a bi-weekly news letter from the superintendent.

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The Phi Delta Kappa men of West Virginia are attempting this year to exchange through a clearing officer articles and pieces of research which may be of use to the individual members. Superintendent A. C. Davis, of Williamson, who is chairman of this group, is acting as collector and distributor of this material. He will be glad to hear from anyone who has research data that will be of interest to the school men of West Virginia.

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The American Association of State Universities has lately recognized the place of research in university administration by the appointment of a committee to investigate the matter of student fees in institutions of higher learning. The committee consists of President Coffman of Minnesota, Chancellor Lindley of Kansas, and President Hughes of Miami. Besides appointing the committee, the Association also appropriated funds to cover the expenses of the enquiry for the coming year.

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Many of our readers have no doubt begun to realize that the investigations which the Commonwealth Fund has been subsidizing are beginning to appear in the form of reports. Recently, in rather quick succession have

appeared splendid monographs by William S. Gray, by Guy T. Buswell, and by Charles H. Judd and Guy T. Buswell. These monographs are all on the general subject of reading. If the Commonwealth Fund has been as fortunate in selecting its types of investigation and the persons to conduct them as it has been in these instances, it will deserve the continued confidence of the educational public.

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The National Association of High-School Inspectors at its meeting last March appointed a committee to take steps to ascertain standards of intelligence and achievement in the various grades of the senior and junior high school. Professor H. G. Childs, of Indiana University, is chairman of a subcommittee which is considering the problem of tests to be used. School people who have used intelligence and subject-matter tests in grades from the seventh to the twelfth will do well to communicate with Professor Childs, giving him their opinions of the tests they used with the reasons for their opinions.

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The day when the *Journal of the National Education Association* will circulate half a million copies monthly is not many years away. The membership goal for the present year is 250,000 and, considering the plans that are under way for a variety of membership drives there is reason to believe that the goal will be reached. There were those who thought that as the membership increased the proportion who would annually cancel their membership would increase. The opposite has been the case. Indeed, the farther the membership extends down into the untrained and comparatively inexperienced groups of teachers the surer seems to be the Association's appeal. Is it not possible that the untrained teacher needs the Association even more than does the trained teacher?

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Doctor William A. McCall is director of Psychological Research for the Chinese National Association for the Advancement of Education. He has already prepared one or two manuscripts to be published both in Chinese and in English. He is to be stationed at Nanking for the first semester with an office at the National Southeastern University where he will be assisted by members of the faculty of that institution. The second semester he will be at Peking. In the organization of Chinese education he represents its scientific aspects. Already some sixty individuals have accepted the invitation to assist the association to complete its program for the year or to adjust to this program studies already under way.

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The following comment which the mail man lately brought us gives us a heightened sense of responsibility: "In the great mass of mighty useful literature that is coming out, articles and textbooks, the question of saving time and of reading not only what is good and useful but more particularly what is timely for the problem at hand is a big job. I wonder if you editors realize how much we must rely upon the care, scholarship, and discriminating judgment displayed by your book reviewers and critics? This is no kick, even by inference. I much appreciate your review department,

others do too. You can see, therefore, how extremely necessary it must be to keep that department of the JOURNAL OF EDUCATIONAL RESEARCH upon the highest plane."

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The State Department of Education for Maryland has recently issued two very interesting bulletins. One is on Silent Reading (No. 4, Volume IV, October, 1922). The other is on Arithmetic (No. 5, Volume IV, October, 1922). The authors of these bulletins have begun their work where the average writer leaves off. Not only do they suggest how to handle standardized tests in these subjects but they place special emphasis upon the remedial measures which may be used after the tests have been given. For example, concrete suggestions are offered for increasing the pupil's vocabulary, his comprehension, and speed in reading. In a like manner, the Bulletin dealing with arithmetic offers devices and methods for speed and accuracy drills.

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The Trustees of Teachers College have announced the appointment of Dr. Stephen S. Colvin of Brown University as Professor of Education. Professor Colvin has a nation-wide reputation for his studies in psychology as applied in the field of the measurement of intelligence. His mental tests for students have created interest throughout the collegiate world. It has been largely because of his efforts that the work of mental testing in connection with educational guidance has been operative longer at Brown than at any other institution of higher learning in the country. Professor Colvin is a graduate of Brown University. He studied at Clark University and was a student in the University of Berlin and also in the University of Straasburg where he took his doctor's degree in 1897. He was professor in the University of Illinois 1901-12, and in Brown University from 1912 to the present time. He is the author of several books on psychology and philosophy and a frequent contributor to psychological and educational journals.

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A unique course in School Administration is being carried on at Ohio State University under the direction of Dr. E. J. Ashbaugh. This graduate seminar, made up of principals and superintendents from the schools of Franklin County, is conducting an intensive study of the school conditions of that county. The primary purpose of this course is to improve the efficiency of the schools of the county by increasing the administrators' knowledge of existing conditions. Each member is assigned a special problem which he directs, being assisted by the cooperative efforts of the other members of the group. The problems to be investigated are: child accounting, finance, building and equipment, cost of transportation, job-analyses of the duties of the principal and superintendent, training of teachers, curriculum, home reading, extra-curricular activities, athletics, health, parent-teacher associations, and the money spent by parents for special education in music, dancing, and similar activities. County Superintendent Cookson who is studying one phase of extra-curricular activities has high hopes of the results which will be obtained by this intensive study of the schools by men so closely interested in the work. This course in practical educational research seems to combine in a most

satisfactory way a study of the theories of school administration and the investigation of actual conditions.

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Among the many plans that have come to hand for the observance of Education Week last December none has struck us as being more in keeping with the purposes of the national education program than that which was followed at Tulsa, Oklahoma. A "pageant of education, America, the Land of Visions," provides the setting. Among the ideas and ideals set forth are those of hope, patriotism, "no illiteracy in 1927," "equality of opportunity," progressiveness, education ("the only basis upon which can be created a successful democracy"), health, culture, knowledge, industry, loyalty, cooperation, Americanization. One quotable sentence concerning illiteracy may be reproduced: "If there are any persons in the community not able to read English or talk it with a fair degree of intelligence, let the test of their loyalty be their willingness to learn and the test of our patriotism be our willingness to teach them."

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Under the direction of Superintendent Charles S. Meek and his colleagues at Toledo a city-wide testing of the elementary-school children in reading and arithmetic has lately been attempted. The Stone Narrative Reading Scale, the Monroe General Survey Arithmetic Test, and the Buckingham Scale for Problems in Arithmetic were used. Tabulations have now been completed and the work of diagnosis is just beginning. It is the firm conviction of the Toledo people that in giving the tests and in making the tabulations they have merely laid the foundation for the real work which their testing program makes possible. Superintendent Meek is utilizing the services of the Ohio State Bureau of Educational Research in connection with this program. Readers of Doctor W. S. Gray's monograph on "Remedial Cases in Reading" will recall that last year the school people of Toledo worked on the diagnosis of individual differences in reading. The present project is broader, with corresponding lack of intensity.

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Dr. George A. Coe and Dr. Albert Shiels have been appointed to professorships in education at Teachers College, Columbia University. Professor Coe is a graduate of the University of Rochester and of Boston University where he took his doctor's degree in 1891. He was a student in the University of Berlin, and afterward became Professor of Religious Education in the University of Southern California, in Northwestern University, and in Union Theological Seminary. He is a leader in the field of religious education and the author of several books on education, notably "The Psychology of Religion" and "The Religion of a Mature Mind." Dr. Shiels is a graduate of the College of the City of New York. He was teacher, principal, and district superintendent of the schools of New York City from 1890 to 1913, Director of the Division of Reference and Research of the New York City Board of Education, 1913-16, Superintendent of Schools of Los Angeles, 1916-1919. He is actively identified with movements affecting the immigrant and the assimilation of foreign population. Dr. Shiels' appointment in Teachers

College is on the Schiff Foundation, endowed by Mr. Felix M. Warburg in memory of Jacob H. Schiff.

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At the recent meeting of the State Teacher's Association held at Boise, Idaho, a State Research Association was organized. This association will be represented at the annual State Teacher's Association by a section of the general association. The purpose of the organization is to coordinate the various efforts of the schoolmen of the state in the study of the educational problems in their schools. The plans of the organization include an intensive study of four problems agreed upon by the members of the association. The problems to be studied during the coming year are as follows: (1) the educational and mental status of the fifth-grade pupil, (2) the age-grade and years in school status of the elementary-school pupil, (3) the devising and standardizing of an individual, uniform, cumulative record card, and (4) the experimental determination of the efficiency of methods of teaching spelling. During the past few years several studies of research character have been undertaken in different sections of the state, but the results have not been pooled in such a way as to supply information to the school people. It is hoped that the new research association will accomplish this purpose. C. L. Harlan of Lewiston is president and L. A. Thomas of Lewisville is secretary.

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The Research Division of the N. E. A., which was established a little more than a year ago, is giving a splendid account of itself under the leadership of Director John K. Norton. Our readers are already familiar with the bulletins which have been issued from this Division.

The director plans to issue a legislative bulletin in January. It may be out before this item appears. This bulletin will be devoted to state educational needs and to facts concerning teacher retirement systems, tenure laws, minimum salary laws, and state school costs. A salary bulletin is announced for February. Another on sources of state revenue with special reference to educational finance will embody recent data in connection with a continuous study of revenue which the Division of Research is maintaining. Two other bulletins are announced for early publication. One is on state distributable funds, and the other on city-school costs.

The widespread interest in the topics of which these bulletins will treat is an evidence of the extent to which the Research Division is meeting the most pressing demands upon it.

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In school X, teacher E was rated low in results of teaching. He protested saying that his results must be high because his pupils averaged 92 in the Standard Spelling Test while the pupils of two other teachers in the same department, but with different grades, averaged only 85 and 89 respectively.

The principal used statistics to prove that the high average of the pupils in E's class was not due to E's teaching. The words used in the test were checked with the total list of words which E had taught during the year. It was found that only two of the words on the spelling-test list had been taught

by him. Therefore he had taught two words in comparison with the twenty-three words which he had not taught.

The range of the number of times words were missed by the 138 pupils in his classes was from 3 to 37, i.e., word 8 was missed only 3 times while word 21 was missed 37 times. Of the two words which had been taught by E, one was missed 9 times and the other 18 times with an average of 13.5 times. This was slightly more than the average number of times the 23 words not taught by E were missed. This showed that the results of his teaching were negligible in as far as the test was concerned.

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Superintendent Charles A. Wagner of Chester, Pennsylvania, has worked out an interesting plan for rating teachers. This plan is set forth in a leaflet which also contains the salary schedule for Chester. This salary schedule is set up in conformity to the recent salary law passed by the Pennsylvania legislature. The distinctive features of the plan which Superintendent Wagner has worked out are as follows:

1. The definite relation between rating and salary; no teacher can secure increases unless her rating is above a certain figure.
2. Careful definition of the items in the marking scale. In this connection Superintendent Wagner believes he has come "as near a stable and unvarying base as any proposal involving variable human judgment can come."
3. A specific determination of responsibility for rating teachers on each of the items of the scale.
4. Provision that no matter how many officers are responsible for a given item agreement must be reached so that but one mark goes before the teacher.

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Doctor C. W. Stone, State College of Washington, Pullman, Washington, reports some interesting data secured by applying the Illinois General Intelligence Scale four successive times to the same pupils. As might be expected, there was a marked increase in the mental ages—more marked than the increase in the chronological age in the intervening time would lead us to expect. There was, therefore, an increase in the intelligence quotients. How should data of this sort be handled? Should we use the results of the first test only, or of the last test only, or should we pool the results of the four testings? In the present state of our standards on this as on all intelligence tests, we must obviously use the first testing. This is because the standards were constructed on the basis of first tests.

Doctor Stone's material, however, is decidedly interesting and suggests the possibility of determining truer standards on the basis of the last of a series of testings during which the pupils may be supposed to have reached the highest degree of understanding and technical skill in this type of test of which they are capable. Undoubtedly, if enough pupils could be thus brought to the point of maximum acquaintance with the test procedure, the results secured after this condition had been reached would be more reliable than the results we are accustomed to use.

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Doctor Arthur S. Otis has published a correlation chart. We received it about two months ago, but it was not until a few days ago that we found time to go through the directions and really come to an understanding of it.

It scarcely seems likely that the chart will justify itself either in the classroom or in the office, unless one is engaged in a project involving the computation of a very great many correlation coefficients. The chart is not suitable for classroom use because it obscures the meaning of the fundamental formula. Nor is it, under ordinary circumstances, useful in the office because it is too complicated to justify the efforts necessary to understand it. Several such charts have recently been published, each one more complex than its predecessor. If, as Doctor Otis says, the purpose of this one is "to make the calculation of a coefficient of correlation as simple as possible," I feel sure that he has failed in his purpose. This is assuming that ordinary classroom and office conditions prevail. We believe, however, that if a very great number of correlation coefficients were to be calculated—enough to provide considerable drill in learning—the work might be facilitated by means of this device.

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Another of the many evidences that the Board of Education at Los Angeles, California, has its face toward the light is exhibited in the fact that it lately sent Doctor A. H. Sutherland on a trip through the country to investigate at first hand certain conditions respecting city-school systems. The particular items of interest were the methods of administering research in the various cities, and the relation of this research to the business management, organization of the board of education, and the superintendent's staff.

Doctor Sutherland found many practical ideas. When we last heard from him, he was coming to the conclusion that many administrative procedures are of such local character that they can not be rendered comparable as between different school systems. For example, on the matter of cost accounting, he says that methods "are based so largely on local conditions that no real comparison can be made accurate. Valuations for taxation, tax rates, and the differences between city, county, and state departments are fundamentally a result of local heritage." Shall we then give up our attempt at cost accounting and kindred subjects, or shall we address ourselves to making practices in different localities sufficiently alike to render them comparable?

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To study and formulate the best methods of selection, transfer, and promotion of public service employees is the primary function of the newly-organized Bureau of Personnel Administration at Washington, D. C. Professor L. L. Thurstone, Head of the Department of Education and Psychology at Carnegie Institute of Technology, Pittsburgh, has been appointed Director of Research in charge of the bureau, effective January 1st, 1923.

The bureau is to be affiliated with the Institute of Government Research, and has been privately endowed subsequent to appeals for its establishment from the United States Civil Service Commission. An advisory board of five members of the national civil service commissions will supervise the operation of the bureau.

Mr. Thurstone and his associates will immediately take up the study of the selection, transfer, and promotion on a basis of merit of all public service employees; classification of the positions in public service; methods of rating

efficiency; reorganization of training courses for federal employees; recommendation of postal clerk and carrier tests; organization and procedure of district offices of the Civil Service Commission; and various other personnel problems outlined by the advisory board. Its field of work covers investigations of state and municipal employee problems in addition to those of the federal service.

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A suggestive type of test is being used by the members of the Research Council of Western Colorado under the supervision of H. T. Manuel, director of Educational Research, Colorado State Normal School, Gunnison, Colorado. In his Research Bulletin Number 20, Director Manuel conveys to members of the Council the method of handling the tests. These tests are of digit combinations. There is one test for each of the four fundamental operations and each test consists of one hundred combinations arranged in a square of ten columns and ten rows.

The conditions of the test require that the same amount of time should be at the pupils' disposal on *each* combination. Accordingly—and here is where the distinctive device comes in—a screen is provided for each pupil. It consists of a piece of Manila cardboard 2¼x3¾ inches in the center of which is a square hole of the same size as the compartment containing the combinations on the test sheet. Pupils are drilled in moving these screens down the columns at command, thus exposing successively the various combinations of which the test is made up. Each combination is exposed for three seconds.

By means of these tests a large number of children in Western Colorado were tested between December 11 and 15, 1922. The object is, of course, to find out more than we now know as to the difficulty of the simple combinations in arithmetic. We shall await with interest the result of this experiment.

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Professor Wren Jones Grinstead is working on an interesting problem in connection with the Latin inquiry which is being conducted by the American Classical League. His problem is "The Psychological Evaluation of a Beginning Latin Text." He aims to provide a sound technical apparatus by which authors, manuscript readers, administrators, and teachers may judge of the efficacy of the methods, material, and organization of a beginning Latin text.

We think this will be one of the most interesting of the many studies that the Latin inquiry will bring forth. It is in line with a number of other investigations whose object is to place a better means of appraisal at the disposal of all those who have to do with the writing, publishing, selecting, and using of textbooks. We shall look forward to the publication of Professor Grinstead's results.

Certain contributory studies will be exceedingly useful. These studies will be concerned with some particular beginning text in Latin. Their object will be to estimate the probable strength of the bond at the end of the year between each Latin word and its English "meaning." A definite outline for pursuing such a contributory study has been drawn up. Professor Grinstead

will be glad to hear of any graduate students who would be interested in studying a Latin text according to this outline. He is now located at Teachers College, Columbia University. The resulting material would be fine data for a master's thesis.

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The following statement recently made by Dean Coursault of the University of Missouri is of decided interest in connection with the organization of university bureaus. Although Dean Coursault has especially in mind the service feature of such a bureau, what he describes is almost exactly the type of work attempted by those organizations to which the name "bureau of educational research" is commonly given. A rose would smell as sweet even if it were called a cabbage.

Dean Coursault is urging the establishment of a bureau at the University of Missouri. Among other things he says: "For the most valuable type of graduate work, a bureau of educational service is indispensable. . . . The bureau would be of far-reaching and direct advantage to the schools of Missouri. It would help progressive educators to increase their efficiency while in service; it would furnish information necessary to improve individual schools; it would secure useful information regarding the educational situation in the state as a whole and furnish a basis of facts for the guidance of those responsible for the direction of the larger educational affairs of Missouri.

"But the advantage I wish to emphasize here is that this bureau would bring to our graduate students the most vital educational problems of Missouri for study and the data needed in solving these problems. It would indeed make the schools of the state a laboratory for these graduate students in the educational problems, giving them an intimate knowledge of the facts and needs of Missouri schools. While obtaining the best kind of advanced professional training, these students would be doing a valuable service for the state."

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From time to time statements have been made as to the high value of the vocabulary test in the Stanford Revision of the Binet Scale. Relying rather implicitly upon such statements some workers have attempted to utilize the vocabulary test in lieu of the entire Binet scale. An interesting paragraph describing an attempt of this sort has been sent us from Mr. B. G. Ludwig of the Marietta (Ohio) public schools. The paragraph reads:

"In trying to find a formula for finding the I.Q. of pupils by using the vocabulary test alone in the Stanford Revision of the Binet-Simon Intelligence Tests the correct answers were divided into two classes, those answers in terms of use and those superior to use. Thirty-five children were examined, all white. Of this number fifteen had I.Q.'s above one hundred; while twenty had I.Q.'s below one hundred. The I.Q.'s ranged from 50 to 147; the chronological ages from eight years eight months to fifteen years eleven months; the mental ages from nine years six months to seventeen years. Although the study has not yet been completed the data so far point toward the conclusion that no formula can be found which will give satisfactory I.Q.'s in a sufficiently large percent of the cases to justify its use. While the

average difference (using a temporary formula) between the I.Q. secured from the test as a whole and that secured from the vocabulary is less than 8.5 and can probably be still further reduced, there are several cases which differ by 20 to 40 points (34 percent differ by 10 points or more) and there seems to be no way of detecting just which cases are likely to be the unusual ones. Or, if it is possible, it will take more time to look up the necessary extra data than it will to give the whole Binet-Simon Test; and even then the results will not be as accurate. The correlation between the number of correct definitions and the mental ages is 82.5, substantiating Terman's contention that it is one of the most valuable of the whole group of Binet-Simon Tests."

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Our readers will be interested in a periodical which is being brought out by a group of teachers in London, England. It is called *Educational Research* and is issued as a supplement to *The Head Teachers' Review*. The current number contains an article on the use of the Terman Group Test of Mental Ability. It contains among other things the most satisfactory treatment we have found of the validity of the alternative test—i.e., the test in which only two answers are possible, one of which is wrong and the other right. The author of this article performs a new and interesting experiment in which he has children give the correct answers to questions when only the numbers of the questions are given. In other words, the questions are imaginary and children merely play a game in guessing. He then lines up the scores in guessing answers with the mathematical probability of these guessed answers. He similarly lines up responses to test 6 of the Terman Group Tests with the guessed scores when the questions are not presented and the probability determination. His conclusion is that "the question with only few alternative answers proves satisfactory."

The interesting feature about *Educational Research* is that it is a publication by an organization of teachers. The idea is definitely expressed in more than one connection that the teachers cannot afford to let the administrators get ahead of them in the use of research methods. Indeed, they declare their intention of keeping ahead of the administrators. A rivalry of this sort would be a good thing in America.

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### The Point System at Xenia, Ohio

At Xenia classes are divided into three sections according to ability. This division is first made on the basis of intelligence testing. At the end of the first quarter certain reclassifications are made. These take place on the basis of points earned according to a point system which has been adopted for the purpose. It is applicable to the first eight grades.

According to this system, pupils are rated not only in school subjects but in attendance, punctuality, and attitude. In all of these a five-point system (E, G, A, P, and F) has been adopted. E is worth ten points; G, five; A, two; P, one; and F, none. The conditions under which marks E, G, etc.,

are given are definitely set up. For example, the mark of E in attendance is conferred if a pupil has been present every day—in other words, for 100 percent attendance. Each day's absence deducts 5 percent. Under the heading of punctuality each case of tardiness deducts 2½ percent.

In converting the percents for punctuality into the letter ratings, 100 percent is E, 90 to 99 percent is G, 75 to 90 percent is A, 60 to 70 percent is P, and below 60 percent is F.

In the matter of reclassification the pupils having the highest number of points in each section are moved up, while those having the lowest number are moved down. No excuses are accepted for absence or tardiness—that is, no excuse mitigates the effect of the absence or tardiness on the points which a pupil earns. As a matter of fact, every absence and tardiness must be excused by the parent in order to prevent the pupil from being classed as a truant.

As Superintendent Waltz says, "There are several good points in this arrangement." He then gives an enthusiastic statement of these points from which we cannot do better than to quote. "First of all the results in application are almost amazing; secondly, we have lowered our tardiness and unnecessary absence greatly. The indications are that tardiness will become a negligible factor; and finally, we have gone far to destroy those feelings of intellectual superiority and inferiority that arise when divisions are made solely on the basis of mental tests. The chap who works hard, comes on time every day, and has the right attitude can get there. The indifferent boy who thinks he has his place 'cinched' is likely to get left. Pupils have gone from C to A this second quarter, and others dropped from A to C. But the spirit of the thing! The attitude toward the school and work is the most pleasant surprise to all of us! Parents have taken more interest in their children and in the schools than the oldest teacher has ever known. More children have been taken to physicians and specialists for physical examinations and the correction of defects than we ever expected."

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### Cooperative Testing Program

The elementary-school principals' association of Seattle, by unanimous vote, requested that the Illinois Intelligence Test be given, May 1922, to all elementary pupils above grade II-A, to be followed in September by achievement tests.

This test was given, under the supervision of the Child Study Department, to 22,345 elementary pupils. In order to secure valid results, uniformity in administering and scoring the tests was obtained by training the principal and one teacher from each building.

The results were tabulated by the teachers under direction of the principals and rechecked by the members of the Child Study Department. From these tabulated scores a graph was made for each building by the Child Study Department.

The two outstanding disclosures made by the test were the extreme variations in mental age in the same grade and class, and the grade variations in the system. The results show the need for study of the problem of classification looking forward toward a more scientific method than teacher's ratings, and some modification in the course of study or in its application.

The most gratifying result has been the intense interest manifested by principals, teachers, and parents in an earnest desire to make use of the results in studying building problems and individual pupils.

NELLIE A. GOODHUE

*Child Study Department, Seattle*

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**A Comparison of Consolidated and One-Teacher School Based upon Results Obtained on the Buckingham-Stevenson Place Geography Tests**

One of the interesting by-products of the state-wide testing program in Place Geography which was conducted during the past November is the relative attainments of pupils in consolidated and in one- and two-room buildings.

These data were furnished by County Superintendent J. W. Whitmer of Lucas County. The total number of pupils was 2,311 in the consolidated schools and 1,135 in the one- and two-teacher schools. Each of these pupils took three forms of the United States test and three forms of the World test. Only the data for the first form will be given here, since the results from the other two indicate the same conditions. Table I presents in concise form the scores on the Buckingham-Stevenson Place-Geography Tests, made by pupils in the consolidated schools and by pupils in the one- and two-teacher schools.

TABLE I. ATTAINMENT IN PLACE GEOGRAPHY IN CONSOLIDATED AND IN ONE- AND TWO-TEACHER SCHOOLS (MEDIAN SCORES)

| Type of School | Grades | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | V | | VI | | VII | | VIII | |
| | World | U. S. | World | U. S. | World | U. S. | World | U. S. |
| Consolidated..... | 12.3 | 9.9 | 23.7 | 16.6 | 37.6 | 23.3 | 40.0 | 28.3 |
| One- and two-teacher | 4.1 | 6.7 | 11.2 | 11.2 | 26.8 | 20.8 | 35.3 | 30.2 |
| Difference in favor of consolidated schools. | 8.2 | 3.2 | 12.5 | 5.4 | 10.8 | 2.5 | 4.8 | 1.9 |

In grade v we find that the consolidated schools obtained a median score of 9.9 on the United States test, while the one- and two-teacher school made only 6.7, with a difference of 3.2 in favor of the consolidated schools. On the World test the pupils in the consolidated schools showed still greater superiority. The median score for the consolidated schools was 12.3 and for the other type of schools 4.1. In only one grade in one test did the pupils of the one- and two-teacher schools surpass the pupils in the consolidated schools, namely, in grade VIII on the United States test.

These data show quite conclusively that a pupil in a consolidated school knows considerably more about place geography than does a pupil in the usual

country school. It is possible that the teachers in the consolidated schools have emphasized place geography to the detriment of the other important phases of geography teaching. An interesting follow-up program to throw light on this situation might be attempted. These same pupils could be given a test to measure information (other than location) and their ability to apply geographical knowledge to concrete situations. We could then determine whether the consolidated schools had emphasized place geography more than other phases of geography instruction. The Bureau of Educational Research is now engaged in standardizing a so-called "Information-Problem Test." The information has no direct reference to location and the problems are intended to measure the pupils' understanding of human relationships.

Before any real conclusions should be drawn concerning the relative efficiency of either type of school we should also know something about the intelligence of the respective pupils.

P. R. STEVENSON

*Bureau of Educational Research,*
*Ohio State University*

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**Physical Condition of Children Entering Special Classes**

Since the school year of 1913-14 all children whose mental examination showed them to be seriously retarded and probable candidates for a special class have been followed up with a questionnaire. The first part of the questionnaire relates to certain easily obtained data regarding the family, to the child's school success, and to his social and moral capacities. It is filled out by those who come in touch with the child in the school, generally by the principal and teacher. The school doctor then makes a careful physical examination of the child and enters appropriate data on the next part of the blank. After that the school nurse, knowing her district and with an understanding knowledge of the information to be obtained, goes into the home where she can obtain first hand all the facts about the home conditions and the family history. These data are grouped under the following general headings: birth, childhood, personal capabilities, industrial activities, father's history, mother's history, family history, and physical condition of the home. It may be well to say in passing that if there are any remediable defects discovered by the doctor, the family is informed and urged to have them taken care of. This is done as far as possible before the child is placed in the special class for defective children.

Naturally, some rather interesting data have been gathered. This year, for example, the question arose as to the presence of physical defects among these children who were placed in the special classes. Were these children more physically handicapped than normal children? The cases studied were those of children who were classed as defective on the basis of school report, physical examination, family history, and the mental examination. Borderline or doubtful cases were not included. Reports on 1,176 children were used as a basis for this study. Among these 1,176 children, physical defects were found as shown in Table I:

TABLE I

| Type of Defect | No. of Children | Percent |
|---|---|---|
| Tonsils | 166 | 14 |
| Malnutrition | 147 | 12 |
| Cripple | 130 | 11 |
| Vision | 117 | 10 |
| Chest | 110 | 9 |
| Organic | 74 | 6 |
| Flat feet | 49 | 4 |
| Goitre | 31 | 2 |
| Adenoids | 31 | 2 |
| Hearing | 20 | 1 |
| Incontinence | 17 | 1 |
| Phymosis, Circumcision, etc., | 15 | 1 |
| Nasal obstruction | 14 | 1 |
| Miscellaneous | 43 | 3 |
| Stigmata | 449 | 37 |
| Forehead—narrow, receding, etc. | 144 | |
| Ears—Tubercle, Darwinina | 77 | |
| Microcephalic | 74 | |
| Rachitic | 56 | |
| Teeth—peg, Hutchinson, etc | 33 | |
| Prominent stomach, etc | 24 | |
| Facial asymmetry | 14 | |
| Mongolian | 9 | |
| Hydrocephalic | 5 | |
| Saddle nose | 4 | |
| Club feet | 3 | |
| Club finger | 1 | |
| Peculiar facial expression | 1 | |
| Cretin | 1 | |
| Ataxic gait | 1 | |
| Protruding jaw | 1 | |
| Soft palate | 1 | |

Only 36 percent of the children were without defects. Many children were afflicted with several. Table II gives details on this point.

TABLE II

| Number of defects | Number of children | Percent |
|---|---|---|
| 0 | 409 | 36 |
| 1 | 371 | 31 |
| 2 | 230 | 18 |
| 3 | 104 | 9 |
| 4 | 52 | 5 |
| 5 | 16 | 1 |
| 6 | 3 | 0.3 |
| 9 | 1 | 0.1 |

BERTHA LUCKEY

*Psychological Clinic, Cleveland, Ohio*

### The Best Time for Memory Work

Lately we had brought to our attention an interesting experiment conducted by the Educational Research Committee of the London Head Teachers' Association, London, England. Three poems were selected which were regarded as equally difficult. Children in the upper grades of the elementary school were given ten minutes in which to learn as much as they could of these poems. Twenty-four hours later they were given an opportunity to write as much of them as they could remember. The classes were divided into three groups and each group learned each poem at a different time of day. The three times at which the learning began were 9:50 A.M., 11:50 A.M., and 4:20 P.M. The learning done at 4:20 P.M. appeared to be as good as that which was done in the morning hours. Difficulty arose, however, due to the fact that the three poems were not of equal difficulty.

A second attempt was made to secure data on this question. This time a single poem was chosen and broken into three parts. These three parts were learned as the three poems had been learned on the first trial. By a little adjustment comparable figures were secured. In the units of the experiment the group of classes which studied at 9:50 scored 10.3; the group which studied at 11:50, 9.9; and the group which studied at 4:20, 10.4. The fall when the learning was done at 11:50 is mainly accounted for by the fact that two of the four schools had scheduled a swimming lesson for the morning of the test. After this vigorous experience, many children were quite unfit for any serious mental or physical exertion during the rest of the session.

Although the report failed to disclose what its title suggested—namely, the best time for memory work, it probably failed because, at least during the school day, there isn't any "best" time. This is undoubtedly the most significant fact in connection with the experiment. As the writer of the report says: "From the results obtained there was no reason to think that the close of the afternoon is worse for memory work than the beginning of the morning." This is opposed to a very general view. Again, he says: "One would have expected that not only the fatigue incident to the close of the session, but also a certain emotional excitement due to the looking forward to release from school as contrasted with the early swing of the morning's work would have combined to make the earlier period more effective. Perhaps we know as yet too little about fatigue, except subjectively, to dogmatize about it; many of the early tests for it have been discredited, and much of what passed for such may have been largely due to boredom, which modern methods tend to reduce."

# Educational Research Association

(FRANK N. FREEMAN, *Secretary and Editor*)

## ANNUAL MEETING OF THE ASSOCIATION

The program for the meeting during the sessions of the Department of Superintendence has not yet been at this writing entirely completed. President Theisen is working upon it and some details are printed below. Meanwhile a general statement can be made regarding the plans. It is hoped that as many members as possible may be on hand to take part in the discussions not only of the technical papers, but also of certain questions of policy which are to be brought up. There will be two or three open programs—one of them probably in a large auditorium which will accommodate a large audience. In addition to this, there will be two closed meetings and the annual dinner and business meeting at which the President's address will be delivered. The practice has been for the President to review the progress in educational research during the past year. As will be remembered, Dr. Rugg at the last year's meeting gave a more general view of the types of educational research for the past generation. It will be of interest to the Association to hear the President's continuation of the account to cover the past year.

The open meetings will be concerned with topics of rather general interest. Dr. Theisen has in hand a considerably larger number of suggested papers than can be included in the program and is making up the final program from those which are offered. For the closed meetings the discussion will be of a somewhat more technical nature. They will deal either with the technique of investigation or with the results of the more abstruse investigations.

At the last annual meeting committees were appointed which were to report at the coming meeting. The first committee under the chairmanship of Dr. Whipple has considered the question of the relationship between the Association and the other educational associations. The problem of coordination concerns in the first place the question of program and in the second place the question of qualifications for membership. Another committee was appointed to consider and make recommendation concerning the relationships of the educational journals, and of the editorial policy which the Association should recommend concerning its own journal. A third committee is directed to consider and make recommendation concerning the function of the Association. One of the problems is whether the Association should confine itself to pure research, or make this its chief aim, or whether its aim should be to promote what has commonly been called "educational research" in public school systems, but which is chiefly the application to administration of methods of testing which themselves have been worked out by research. The issue concerns qualifications for membership and the character of the program of the annual meeting as well as the editorial policy with reference to the journal.

A proposal has been made to form a branch association on the Pacific Coast and this will be considered at the meeting. Another proposal has been made that the Association in some way take the responsibility for summarizing for publication the educational research of the country. It will be seen that the forthcoming meeting should be an important one, and these preliminary announcements are made in order that the members may come somewhat prepared to act upon the issues to be presented.

## EDUCATIONAL RESEARCH ASSOCIATION

*President*, W. W. Theisen, Assistant Superintendent of Schools, Milwaukee, Wisconsin.

*Secretary*, Frank N. Freeman, College of Education, University of Chicago.

WEDNESDAY AFTERNOON, FEBRUARY 28, 2:00 O'CLOCK *Sharp*
Ball Room, Hollenden Hotel
Topic: *Instructional Research.* Part I

Children's Erroneous Concepts of the Commonplace in History and Geography
Garry C. Myers, Cleveland School of Education. (15 Minutes)

Measurement of a New Phase of Reading
Clifford Woody, Director of Reference and Research, University of Michigan. (15 Minutes)

The Validity of Methods Employed to Determine Spelling Vocabulary
Frederick S. Breed, Assistant Professor of Education, University of Chicago. (15 Minutes)

How an Instructional Research Department Can Assist Teachers
P. T. Rankin, Department of Research, Detroit Public Schools. (20 Minutes)

Part II. 3:15 o'clock

Can Mass Instruction in American Schools be Individualized?
Harold Rugg, Lincoln School, Teachers College, New York City (15 Minutes)

A Vocational Study of 2000 Junior High School Students in "Clerical Aptitude," "Mechanical Aptitude," "Interest," and Group I.Q.
J. L. Stenquist, Director of Research, Baltimore Public Schools. (20 Minutes)

The Relation of Mental and Physical Growth to School Promotion
Bird T. Baldwin, Iowa Child Welfare Research Station, University of Iowa. (20 Minutes)

THURSDAY MORNING, MARCH 1, 9:15 O'CLOCK
Assembly Hall, Hollenden Hotel (Executive Session for Members Only)

THURSDAY AFTERNOON, MARCH 1, 2:15 O'CLOCK
Public Auditorium. Topic: *Administrative Research*

What Research Can Do for the Superintendent
Jesse H. Newlon, Superintendent of Schools, Denver, and Chairman of the Commission on Coordination of Research Agencies

Methods of Determining Educational Costs
A. B. Moehlman, Director of Reference and Statistics, Detroit Public Schools.

Adequate Cost Analysis as a Basis for Budget Allowances
T. J. Kelly, Dean of University Administration, University of Kansas.

Financing Schools Under the District System
F. H. Swift, Professor of Education, University of Minnesota.

Some School Building Problems Which Must Be Attacked Scientifically
Paul C. Packer, Teachers College, Columbia University.

THURSDAY EVENING, MARCH 1, 6:00 O'CLOCK

Annual Dinner, Hotel Winton. (For members and invited guests only.) Tickets, $2.25. Reservations should be made with the Secretary.

# OHIO STATE UNIVERSITY

## Announcements

# COLLEGE OF EDUCATION

## FOUR QUARTER PLAN

The Ohio State University has adopted the quarter plan of organization, which divides the work of the year into smaller units than formerly and provides for greater flexibility and variety of adjustment. Students are enabled to enter at the beginning of, or obtain degrees at the end of, any quarter. Teachers in service will find the two-term Summer Quarters especially convenient.

### Dates of Quarters During 1922-23

| | | |
|---|---|---|
| **Autumn Quarter** | - | **October 2 to December 22, 1922** |
| **Winter Quarter** | - | **January 2 to March 23, 1923** |
| **Spring Quarter** | - - | **March 26 to June 8, 1923** |

**Summer Quarter (two terms)—dates to be announced later**

## ACADEMIC SUBJECTS

Work in all the standard academic branches (Languages, Fine Arts, History, Mathematics, etc.) is provided for students in the College of Education by other Colleges of the University. This includes courses given from the standpoint of content and courses in methods of teaching the various subjects.

## PROFESSIONAL SUBJECTS

Certain departments classed as "professional" are especially *devoted to the task* of providing teachers and public school administrators with the technique and philosophy essential to the public school service. These include: Principles and Practice of Education (offering 45 courses), Industrial Education (17 courses), History of Education (16 courses), School Administration (31 courses), Psychology (at least 13 of its 39 courses are definitely professional), Vocational and Commercial Education (17 courses).

These facilities make possible the certification privileges which accrue to graduates of the College of Education. Students completing the general curricula are entitled to a State Provisional Certificate to teach in any Ohio high school. The College also provides curricula which lead to Special State Certificates in Fine Arts, Home Economics, and Manual Training.

## BUREAU OF EDUCATIONAL RESEARCH

In addition to its functions as a Research Station, the Bureau affords students an opportunity to pursue, under the auspices of the Bureau staff, resident courses of two types: (a) for advanced undergraduates and graduates. Minor Problems; (b) for graduates Major Research, or Major Research Problems. Such courses are listed among the offerings of the Departments of School Administration, Psychology, and Principles and Practice of Education.

## DEPARTMENT OF VOCATIONAL AND COMMERCIAL EDUCATION

By a recent action of the Board of Trustees, this department was established under the Smith-Hughes Law. It has for its specific function the training of the various types of administrators and teachers needed for carrying forward the rapidly developing vocational educational movement. Expansion of this department is in contemplation. The program includes a thorough preparation of teachers for commercial high schools.

*For information address:*

**The Dean of the College of Education**

**THE OHIO STATE UNIVERSITY**

**COLUMBUS, OHIO**